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PROCEEDINGS: CONFERENCE IN THE MATTER
OF POLLUTION OF THE INTERSTATE WATERS
OF THE CONNECTICUT RIVER, MASSACHUSETTS-
CONNECTICUT, HELD AT HARTFORD, CON-
NECTICUT ON DECEMBER 2, 1963

Public Health Service
Washington, D. C.

2 December 1963

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PROCEEDINGS

CONFERENCE
in the matter of
POLLUTION
of the Interstate Waters of the
CONNECTICUT RIVER
Massachusetts - Connecticut

Hartford, Connecticut
December 2, 1963

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service

CONFERENCE
in the matter of
POLLUTION
of the Interstate Waters of the
CONNECTICUT RIVER
Massachusetts - Connecticut

Convened on the Call of the
Secretary of Health, Education, and Welfare
Under Section 8 of the
Federal Water Pollution Control Act
(33 U.S.C. 466g et seq.)
Hartford, Connecticut
Monday, December 2, 1963

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Washington, D.C. 20201

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Conference in the Matter of Pollution of The Interstate Waters of the Connecticut River and Its Tributaries (Massachusetts-Connecticut), convened at 9:30 a.m., Monday, December 2, 1963, at the United States Post Office Building, 135 High Street, Hartford, Connecticut.

PRESIDING:

Mr. Murray Stein, Chief, Enforcement Branch, Water Supply and Pollution Control, Public Health Service, Department of Health, Education, and Welfare, Washington 25, D. C.

CONFEREES:

William S. Wise, Director, Connecticut Water Resources Commission

Worthen H. Taylor, Department of Public Health, Commonwealth of Massachusetts

Joseph Knox, Secretary, New England Interstate Water Pollution Control Commission

Herbert H. Rogers, Boston Regional Office, Department of Health, Education, and Welfare; Regional Program Director

PARTICIPANTS:

Hon. Abraham A. Ribicoff, U. S. Senator from the State of Connecticut

Francis W. Kittrell, United States Department of Health, Education, and Welfare, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio

Rudy Frank, Chairman, Connecticut Board of Fisheries and Game

Mrs. Bernard H. Flood, Member of the Board of Directors of the League of Women Voters of Massachusetts.

Harold E. Irwin, Chairman, Clean Waters Committee, Quabbin Chapter, Izaak Walton League of America, Inc.

Richard P. Schuhlen, Chairman, Izaak Walton League of America, Springfield Chapter, Springfield, Massachusetts

Herbert J. A. Westphalen, Publicity Chairman, Ludlow Conservation Commission, Ludlow, Massachusetts

Leonard J. Collamore, Administrative Aide to Mayor Ryan, Springfield, Massachusetts

Robert Hafey, Executive Director of the Citizens' Action Commission, Springfield, Massachusetts

Dr. Franklin M. Foote, Connecticut State Commissioner of Health

PARTICIPANTS (Continued):

Arthur W. Sweeton, III, Deputy Manager and Chief Engineer, Bureau of Public Works, Metropolitan District, Hartford, Connecticut

Earl R. Howard, Executive Engineer, Bureau of Public Works, Metropolitan District, Hartford, Connecticut

OTHERS IN ATTENDANCE:

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE:

Rheta B. Piere, United States Public Health Service, Washington, D. C.

Peter G. Kuh, United States Public Health Service, Washington, D. C.

Sidney Edelman, Office of the General Counsel, Washington, D. C.

Harold Clark, Bacteriologist, Taft Sanitary Engineering Center, Cincinnati, Ohio

C. E. Runas, Senior Assistant Sanitary Engineer, Taft Sanitary Engineering Center, Cincinnati, Ohio

Kenneth M. Mackenthun, Aquatic Biologist, Taft Sanitary Engineering Center, Cincinnati, Ohio

Leo A. St. Michel, Chief, Construction Grants Section, United States Public Health Service, Boston, Massachusetts

Herbert R. Pahren, Senior Sanitary Engineer, United States Public Health Service, Boston, Massachusetts

Thomas C. McMahon, Chief, Water Resources Development Section, United States Public Health Service, Boston

Hayse H. Black, Industrial Wastes Consultant, United States Public Health Service, Cincinnati, Ohio

Everett L. MacLeman, Sanitary Engineer, Director, United States Public Health Service, New York, New York

K. E. Biglane, Eastern Operations, Technical Services Branch, United States Public Health Service, Washington, D. C.

Archie B. Freeman, Regional Program Director, United States Public Health Service, Boston, Massachusetts

OTHER GOVERNMENT AGENCIES:

John Horton, District Engineer, United States Geological Survey, Hartford, Connecticut

OTHER GOVERNMENT AGENCIES (Continued):

Edward T. Tracy, Civil Engineer, Corps of Engineers, Waltham, Massachusetts
Mark Abelson, Regional Coordinator, United States Department of the Interior,
Boston, Massachusetts
Harold W. Retchin, Division Vice Captain, USCGA, Springfield, Massachusetts
Carl F. Nelson, Jr., Supervisor, Fish and Wildlife Service, United States
Department of the Interior, Concord, New Hampshire

REPRESENTATIVES FROM MASSACHUSETTS:

Richard M. Power, Sanitary Engineer, Massachusetts Department of Public
Health, Boston, Massachusetts
Paul E. Cormier, President, Izaak Walton League, Springfield, Massachusetts
Harold J. Martin, Mayor-Elect, Westfield, Massachusetts
Robert W. Scott, Vice President, Esleek Manufacturing Company, Turners
Falls, Massachusetts
U.S. Human, Treasurer, Ervine Paper Mills, Ervine, Massachusetts
John E. Hirse, Jr., Allied Chemical Corporation, Boston, Massachusetts
C. J. Carney, Allied Chemical Corporation, Boston, Massachusetts
Richard LeBoeuf, Izaak Walton League, Ludlow, Massachusetts
Thomas R. Friedrich, Technical Manager, Strathmore Paper Company, West
Springfield, Massachusetts
E. J. Ferrell, Technical Director, Crucker, Burbank and Company,
Fitchburg, Massachusetts
Clarence E. Kibbe, Director, Izaak Walton League, Springfield, Massachusetts
E. L. Goldstein, Pioneer Valley Yacht Club, Springfield, Massachusetts
Edward Skoler, Pioneer Valley Yacht Club, Springfield, Massachusetts
Leonard Shapiro, Pioneer Valley Yacht Club, Longmeadow, Massachusetts
Roland C. Reed, Agawam Sportsman's Club and Agawam Conservation Commission,
Agawam, Massachusetts
Mrs. Elizabeth Peerzcholer, Springfield, Massachusetts
Charles H. Fawcner, Amherst, Massachusetts
John D. McDonald, Civil Engineer, Springfield, Massachusetts

A. R. Gierasch, Chief Engineer, Holyoke Water Power Company, Holyoke, Massachusetts

Alan E. Rich, Commodore, Springfield Yacht Club, Agawam, Massachusetts

Wilbur J. Hogan, Vice-Commodore, Springfield Yacht Club, Springfield, Massachusetts

Larry Shayer, Longmeadow, Massachusetts

James M. Vachon, Holyoke, Massachusetts

REPRESENTATIVES FROM CONNECTICUT:

Richard M. Davis, Research Aide, Travelers Research Center, Hartford, Connecticut

John A. DeFilippi, Staff Associate, Travelers Research Center, Hartford, Connecticut

Dr. Edwin E. Pyatt, Senior Engineer, Travelers Research Center, Hartford, Connecticut

Paul Bock, Travelers Research Center, Hartford, Connecticut

Mrs. Elizabeth K. Roper, League of Women Voters of Connecticut, Darien, Connecticut

Charles A. Jaworski, Principal Sanitary Engineer, Connecticut State Department of Health, Hartford, Connecticut

F. O. A. Almquist, Director, Sanitary Engineering Division, Connecticut State Department of Health, Hartford, Connecticut

Merritt M. Comstock, Essex, Connecticut

William A. Boyd, Essex, Connecticut

Alexander T. Papafil, Suffield, Connecticut

Mrs. John Witten, Chairman, Regional Planning Committee, Middletown League of Women Voters, Middletown, Connecticut

Richard N. Symonds, Jr., Regional Planner, Economist, Connecticut Development Commission

J. MacGregor Fraser, Connecticut River Watershed Council, West Hartford, Connecticut

Josephine H. Thomas, League of Women Voters of New Haven, Connecticut

Robert B. Taylor, Sanitary Engineer, Connecticut Water Resources Commission, Watogue, Connecticut

Alfred J. Hunyadi, Chief Conservation Officer, Connecticut Fisheries and Game Department, West Willington, Connecticut

George C. Hancock, Land Aid Chief, Connecticut State Board of Fisheries and Game, Hartford, Connecticut

John W. Kane, Committee for Studying Dredging of Connecticut River, Hartford, Connecticut

John P. McNamara, Sanitary Engineer, Connecticut Water Resources Commission, Hartford, Connecticut

Nervin E. Hupfer, Principal Sanitary Engineer, Connecticut Water Resources Commission, Hartford, Connecticut

George H. Craemer, Deputy Manager and Operating Engineer, Bureau of Public Works, Metropolitan District, Hartford, Connecticut

Lyle M. Thorpe, Director, Connecticut Board of Fish and Game, Hartford, Connecticut

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION:

George L. Burke, Chairman, NEIWPCC, West Hartford, Connecticut

INTERSTATE SANITATION COMMISSION:

T. R. Glenn, Jr., Director and Chief Engineer, Interstate Sanitation Commission, New York, New York

P R O C E E D I N G S

OPENING STATEMENT

BY

MR. MURRAY STEIN

MR. STEIN: The conference is open.

This conference in the matter of pollution of the interstate waters of the Connecticut River and its tributaries, involving the States of Connecticut and Massachusetts, the New England Interstate Water Pollution Control Commission, and the Department of Health, Education, and Welfare, is being held under the provisions of Section 8 of the Federal Water Pollution Control Act.

Under the provisions of the Federal Act, the Secretary of Health, Education, and Welfare is required to call a conference of this type, when on the basis of reports, surveys and studies he has reason to believe that pollution of interstate waters subject to abatement under the Act is occurring.

The purpose of the conference is to bring together the State and interstate water pollution control agencies, the representatives of the Department of Health, Education, and Welfare, and other interested parties to review the existing situation, the progress which has been made, to lay a basis for future action by all parties concerned, and to give the States, localities and industries an opportunity to take any remedial action which may be indicated under State and local law.

The conference technique is a rather old one. It is used by many State agencies informally in the normal conduct of their business in the field of water pollution control. The concept of a conference was proposed by the United States Supreme Court as long ago as 1921 in the famous case of New York against New Jersey involving interstate pollution.

I would like to quote from this court opinion:

"We cannot withhold the suggestion, inspired by the consideration of this case, that the grave problem of sewage disposal presented by the large and growing population living on the shores of New York Bay is one more likely to be wisely solved by cooperative study and by conference and mutual concession on the part of representatives of the States so vitally interested in it than by proceedings in any court however constituted."

We strongly support the conference technique, and we in the Federal program measure our success by the situations which are solved at the conference **stage** rather than by the court actions we bring.

Under Section 8 of the Federal Water Pollution Control Act, the Secretary of Health, Education, and Welfare has notified the official State and interstate water pollution control agencies of the conference. These agencies are the Connecticut Water Resources Commission, the Massachusetts Department of Public Health, and the New England Interstate Water Pollution Control Commission.

Connecticut will be represented by William S. Wise.

Massachusetts will be represented by Worthen H. Taylor.

The New England Interstate Water Pollution Control Commission will be represented by Joseph Knox.

Mr. Herbert H. Rogers of the Boston Regional Office of the Department of Health, Education, and Welfare, and our Regional Program Director, has been designated as the conferee for the Federal Government.

My name is Murray Stein, and I am from Washington, D. C., headquarters of the Department of Health, Education, and Welfare.

The representatives of the official agencies are privileged to bring whomever they wish to the conference and have them participate in it. However, this is a conference between the representatives of the State and interstate agencies and the representatives of the Department of Health, Education, and Welfare. These parties constitute the conferees.

Both the States and the Federal Government have responsibilities in dealing with interstate water pollution control problems. The Federal Water Pollution Control Act declares that the States have primary rights and responsibilities for taking action to abate and control interstate pollution. It has always been the policy of the Department of Health, Education, and Welfare to give full recognition to this traditional role of the States. The function of the Department is to encourage the States in these activities. However, the Department of Health, Education, and Welfare is charged by law with specific responsibilities in connection with interstate pollution control problems.

The Federal Water Pollution Control Act provides that pollution of interstate waters, whether the matter causing or contributing to such pollution is discharged directly into such waters, or reaches such waters after discharge into a tributary of such waters, which endangers the health or welfare of persons in a State other than that in which the discharge originates, is subject to abatement. The conference will be useful, we hope, in providing a clear picture of the problem, in delineating the progress which has already been accomplished, and in indicating what still needs to be done to correct the problem.

Under the Federal law the Secretary is required, at the conclusion of the conference, to prepare a summary of it which will be sent to all the conferees. The summary, again according to law, must include the following:

1. Occurrence of pollution of interstate waters subject to abatement under the Federal Act;
2. Adequacy of measures taken toward abatement of the pollution; and
3. The nature of delays, if any, being encountered in abating the pollution.

Subsequent to the holding of a conference, the Secretary of Health, Education, and Welfare is required to make recommendations for remedial action if such recommendations are indicated.

Now a word about the procedures governing the conduct of the conference. A record and verbatim transcript will be made of the conference to give us a record of what is said and done here and to enable us to prepare the summary. Mr. A. M. Zimmer is making this stenographic report. We will make copies of the summary and the trans-

script available to the official State water pollution control agencies of Massachusetts and Connecticut and to the Interstate Commission. We would suggest that anyone interested in obtaining a copy of the summary or the transcript, after the conference, get in touch with their State agencies in Massachusetts or Connecticut. We have found this is the best way of securing the maintenance of proper Federal-State relations.

All conferees will be called upon to make statements. The conferees, in addition, may call upon participants they have invited to the conference to make statements. At the conclusion of such statements, the conferees will be given an opportunity to comment or ask questions. This procedure has proven effective in the past in developing a clear picture of the problem and in reaching agreements on equitable solutions.

At the end of all the statements, we will have a discussion among the conferees and try to arrive at a basis of agreement on the facts of the situation. Then we will attempt to summarize the conference orally, giving the conferees, of course, the right to amend or suggest modifications of the summary.

As many of you, and, I am sure, all of you can see, we have the privilege today of having a very distinguished participant in the conference.

I think it is no small measure of the interest that this distinguished American has had in water pollution that at one time or another he has been the boss of the majority of the people at the conferees' table.

In examining his record in Connecticut and in the Department of Health, Education, and Welfare, with which I am most familiar, there has been no stronger champion of clean air or clean water than Senator Ribicoff.

Without further ado, I would like to introduce Senator Ribicoff.

STATEMENT OF
THE HONORABLE ABRAHAM A. RIBICOFF
UNITED STATES SENATOR FROM THE STATE OF CONNECTICUT

SENATOR RIBICOFF: Mr. Stein, gentlemen:

First let me say that this is a very thrilling experience for me to see what I believe will be the start for successful completion of cleaning up the Connecticut River.

The Connecticut River is one of the most beautiful rivers in the world. Anyone who has taken a boat from Long Island Sound and gone down the Connecticut River to Hartford can't help but be struck by the beauty of this river.

I think one of the great tragedies is what we have done to our river, and the time has come really to restore this river.

I am thrilled too to see Mr. Stein presiding at this conference. As Secretary, I and everyone in this nation who was familiar with the problems of clean water, know that we have here a dedicated public servant who believes that we must clean up our polluted streams. I know that in the Department of Health, Education, and Welfare, as we were developing the various programs, we always relied upon his good judgment, his advice and knowledge, which is as deep as anyone's in this entire country when it comes to the problem of water pollution.

Of course, I am so pleased too to see an old and beloved friend like Bill Wise. Bill Wise is a man whom I liked to work with.

One of the first programs that we had when I became Governor was the problem of restoring the beaches, and the beach erosion programs. This is the work that we did together after the flood.

Bill Wise too is a dedicated public servant who has worked long in this field in the State of Connecticut. I also see here the men from Massachusetts and the various regional agencies I worked with over my six-year term as Governor. Therefore, may I say to you, Mr. Stein, and all your associates from the Department of Health, Education, and Welfare, I welcome you to Connecticut, and we are very pleased to have you here.

This conference is a tangible result of one of the great efforts begun by the Administration of John F. Kennedy. Among his wise and farsighted policies was the preservation of our natural resources and a full-scale attack on water pollution.

As Secretary of Health, Education, and Welfare, it was my privilege to present the views of the then new Administration on the problem of water pollution. In March of 1961 -- just a little over two months after taking office -- I testified in support of legislation to provide for a more effective program of water pollution control on a national scale. President Kennedy had given us our lead earlier when he said in a special message to Congress:

"The pollution of our water has reached proportions of a national disgrace. It endangers our health. It limits our business opportunities. It destroys recreation."

Those words could be applied -- then as now -- to any State in the Union -- to his own Commonwealth north of us and to our great State as well.

One of the early accomplishments of the new Administration was the enactment of the Federal Water Pollution Control Act Amendments of 1961 -- a bill that greatly strengthened the existing Federal program and provided for the first time a truly all-encompassing, effective and practical anti-pollution program on a national scale.

As Secretary I immediately set about to implement that legislation at the administrative level.

As a result of the strong program enacted by Congress and implemented by the Administration, this conference and others like it throughout the land are being held and will be effective.

The problem of pollution in our State and nation has long been of concern to me. From my earliest observation and study of American history and the American economic and social life, it has been abundantly clear to me that one of the great shames of this country has been the abuse of our great natural assets, especially our streams, our rivers, our lakes -- and all of our water.

The importance of water in our development as a State and nation was underscored some years ago by E. Kenneth Hubbard in his historical essay entitled "Connecticut Industry":

"In this three hundredth year of the founding of Connecticut, it is most fitting to look backward in search of the reasons why the Colony, originally engaged in agricultural pursuits and devoid of mineral wealth sufficient to sustain profitable mining enterprise, should have become one of the most important industrial states in the Union. The progress from the fertile Connecticut River flats, which first gave the early settlers their daily bread, and later 'stock-in-trade' to promote early commerce with coastal and West Indies ports, to the present modern industrial state when more than sixty percent of Connecticut inhabitants are dependent upon over three thousand industrial establishments for their livelihood, is a story more dramatic than fiction itself."

But the price of that "progress" from the fertile Connecticut River flats of three centuries ago to the present modern industrial stage has been the desecration of the river. This beautiful -- at times majestic -- body of water, now winds its ugly, polluted path past signs reading "Beach Closed -- Pollution." Stretches of this once proud river now bear as its official classification: "Suitable for transportation of industrial wastes without nuisance, and for power, navigation, and certain industrial uses."

It shocks and revolts me to learn that where the Connecticut River crosses the State line, the water is so foul that a single drop has a bacteria count of at least 26 -- bacteria that originated in Massachusetts. That is 315 times greater than the bacteriological standard used by Connecticut in approving bathing sites on the river in our State. Studies conducted by our own State Department of Health confirm the presence of this contamination to an extent which can result in the spread of diarrhea, dysentery, and various other intestinal diseases. This threat is present to those who canoe on this river; to those who swim or water ski. Even though the water is not used for drinking purposes, the health hazard exists.

It is time we do something about this! It is time for all units of government -- local, State and Federal -- to work with industry and the public toward the day when we can view the Connecticut River once again with pride and make this great resource once again available to all our citizens.

In the past, extensive work has been done by State, local and private agencies toward that goal. I view this conference as a new beginning of greater efforts in the future.

Here in Connecticut the State Water Resources Commission has been striving since 1925 to control water pollution, working with the State Department of Health, which has related responsibilities. Both Connecticut and Massachusetts are members of the New England Interstate Water Pollution Control Commission, since 1947 active in developing classifications for the interstate inland and tidal waters of the compact area, and in conducting a program of surveys, investigations, and research. The Massachusetts Department of Public Health has conscientiously carried out its designated functions in the field of water pollution control. Progress in construction of waste treatment works has been encouraging, and both States have availed themselves of Federal grant offers under the Federal Water Pollution Act, and, more recently, the Public Works Acceleration Act. Twenty-nine Connecticut projects had been approved as of September 30, for \$5,133,816 in Federal funds; ninety-four Massachusetts projects had been approved for \$13,226,645.

But these achievements unfortunately have not been sufficient to prevent the gross pollution of the Connecticut River. Limited funds, limited staffs, inadequate authority, hamper the best efforts of non-Federal water pollution control agencies. It is time to get out "the broom in the closet." That is why I asked the Secretary of Health, Education, and Welfare to call this conference on the pollution of the interstate waters of the Connecticut and its tributaries, an action taken by the Secretary on September 23. The Federal Act wisely sets out a three-step enforcement procedure -- the conference, the public hearing, the court action. Only in a single instance has the last step had to be taken; only in four cases have public hearings been required. I hope the parties to this conference will work together in a spirit of such cooperation that the more stringent remarks which the Act provides will not have to be invoked. But I believe we must now resolve to take whatever action is necessary to do the job that confronts us. We are going to clean up the Connecticut River. We are here today to start on that task. We will not stop until we have finished the job.

Representatives of the Connecticut Water Resources Commission, the Massachusetts Department of Health, the Interstate Commission, and the United States Department of Health, Education, and Welfare, the participants in this conference, are supplying the key facts and figures which will help you to evaluate the occurrence of pollution, the adequacy of measures taken toward its abatement, and the nature of delays, if any, being encountered in abating the pollution.

Fortunately, we have thus far not had to depend on our principal rivers for water supply. But when we find that between 1960 and 1963 our population has grown 5.2 percent, when we realize that labor-saving devices like dishwashers are making heavy demands on available waters, when we hear of complex new chemical pollutants and detergents entering our streams, we have to consider the prospect that in future years it may be necessary to draw on these rivers for supply purposes. I am reminded that you don't miss the water until the well runs dry. And we must keep in mind that pollution reduces the available water supply like a drought. We can talk about it, but we can't do anything about a weather-caused drought. We can do something about pollution.

When we set out to raise the quality of our streams, we call on several aids -- waste treatment works construction, research, training of specialized personnel, development of sound programs at all levels. The first permanent national law to establish a comprehensive water pollution control program was enacted in 1956 and strengthened in 1961, when I was Secretary of Health, Education, and Welfare. Recently

the Senate passed a bill, of which I am a co-sponsor, to make further improvements in the national program.

It is my belief that other aspects of the problem need attention, such as the provision of reasonable financial incentives for industry to install needed abatement works. I have introduced two bills, one to make low-interest loans to small business, the other to permit fast tax write-offs for nonprofit-making treatment facilities, and tomorrow I intend to introduce my tax proposal in the form of an amendment to the tax bill now under consideration in the Senate Finance Committee.

Gentlemen, there is no simple, total answer to this gigantic national problem -- the assurance of an abundant supply of good-quality water for today's needs and tomorrow's. One answer is the kind of conference which has been convened here in Hartford today. It brings together responsible parties to seek agreement on the best means of restoring to reasonable purity, for the benefit of all who would use them, the waters of the Connecticut, the great river whose fertile flats first gave the early settlers their daily bread.

It may be unrealistic to expect to restore this river to the pristine condition of by gone days. But we can work to rid it of its filth and restore it to a condition that will permit men and women, boys and girls, to find recreation -- for many of them release from the pressures of crowded city life -- in and along the Connecticut, the beautiful river which gave our State its name. Boating, fishing, swimming, should be possible if we set our sights high enough and work hard enough.

I believe that the people of this entire area have a right to expect significant results from this conference and, with the active cooperation of all involved, that the Connecticut River will be clean again for the benefit of all our people.

I again want to thank all the distinguished people at this conference, and I am confident that as a result of the efforts today we will begin none too soon to clean up the Connecticut River, to make it the river it deserves to be. As we are proud of the name "Connecticut," which is the name of our State, I would like to be just as proud, as all of us would, of the Connecticut River, which should reflect the beauty and cleanness of the State of Connecticut.

MR. STEIN: Thank you, Senator, for an excellent and comprehensive statement.

I think we can all recognize and realize why Senator Ribicoff, in addition to his other attributes, is universally recognized in Washington and throughout the country as one of the legislative experts on water and air pollution, and, indeed, a legislative statesman in this area.

I think the people of the State should indeed be proud of the national recognition that has come to their State, and of Senator Ribicoff for his expertness in these areas.

At this point we also have a message sent to us from Senator Edward Kennedy, which I would like to read. It says:

"I regret that it is not possible for me to be in Hartford on December 2 to express in person my interest in the objectives of this conference. Secretary Celebrezze, in calling a conference in the matter of the pollution of the interstate waters of the Connecticut River and its tributaries, has provided an opportunity for cooperative action among the Commonwealth of Massachusetts, our neighboring State of Connecticut, the New England Interstate

"Water Pollution Control Commission, and the United States Department of Health, Education, and Welfare, to improve the quality of these waters.

"The Connecticut River is our region's greatest stream. That Massachusetts ranks high among the States in diversified manufacturers is due in no small measure to the plentiful water power with which we were favored. Thriving communities grew up along the river banks. Into the clear waters of the Connecticut and its tributaries were dumped the wastes of mill and municipality. Belatedly here, as in other parts of the United States, it was recognized that users of water ought not to be abusers of water. The Massachusetts Department of Public Health, the State agency with primary responsibility in the field, the New England Interstate Water Pollution Control Commission, to which our State is signatory, and local authorities have worked in their own spheres and cooperatively to abate the pollution of our waterways. The Federal Water Pollution Control Act, notably that section authorizing grants for the construction of waste treatment works, has provided valuable tools for the combat of water pollution. Excluding the additional funds supplied under the Public Works Acceleration Act, Massachusetts communities had been granted, as of October 31, 1963, \$9,548,441 in Federal funds for waste treatment works construction.

"The Commonwealth has participated in the Federal program in conformity with both the letter and the spirit of the Federal Act, which sets forth the policy of Congress to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water pollution. This conference, too, convenes under the letter and in the spirit of that Act. Its purpose is to assemble the State, interstate, and Federal authorities concerned to find together the best means of raising the quality of these interstate waters. I know that Massachusetts is determined to improve its own waters and to be a good neighbor to the downstream State of Connecticut with which it has shared this great river, and so many common endeavors, for more than three hundred years.

"I stand ready to assist in any way that I can, including the appropriation of whatever Federal funds are necessary, the two States, the Interstate agency, and the cooperating Federal officials, in achieving the purposes of the conference. I request that the record of the conference be left open for one week, should I wish to submit a fuller statement."

That concludes the statement submitted by Senator Kennedy.

At this point, I would like to call on Mr. Taylor for a statement from the Governor of Massachusetts.

Mr. Taylor.

MR. TAYLOR: Mr. Stein, the Governor of Massachusetts had fully intended to be here, but because of the events of the past week-end, it has been necessary for him to stay in Massachusetts today. He has prepared this statement which he has asked me to present to the conference:

STATEMENT OF
THE HONORABLE ENDICOTT PEABODY, GOVERNOR OF MASSACHUSETTS
BEFORE THE CONFERENCE ON WATER POLLUTION CONTROL
IN THE CONNECTICUT RIVER AND ITS TRIBUTARIES

December 2, 1963

Hartford, Connecticut

"Mr. Chairman and Members of the Conference:

"As Governor of the Commonwealth of Massachusetts I am cognizant of the pollution currently being discharged to many of our public waters, particularly I am cognizant of the damages to water quality resulting from such pollution.

"Massachusetts is a densely populated and highly industrialized community, it has limited water resources and thus it is essential to preserve all of our waters in conditions suitable for the proposed highest use. In many instances our water must be preserved for sources of public water supply, recreational, agricultural, and industrial uses.

"Early in the history of this nation our Massachusetts waters were used extensively to supply soft clear water for our flourishing textile economy. Little thought was given to the other uses of public waters and thus the problems of water pollution control were continued unheeded until 1945 when the Commonwealth adopted its first comprehensive water pollution control act. Since that time much of the energy of the Department of Public Health in its role as the water pollution control agency of the Commonwealth has been spent in surveys of our streams and our industries to learn their needs in the field of pollution abatement. The efforts of our Lawrence Experiment Station have been devoted largely to studies of ways and means of treating sewage and specific industrial wastes.

"With the advent of grants-in-aid through the provisions of Public Law 660 of the 84th Congress, the construction of municipal pollution abatement facilities has been intensified. Our construction program is such that we have been able to take maximum advantage of grants provided both under Public Law 660 and the Accelerated Public Works Program. Indeed, many of our projects have not received the Federal grants-in-aid as funds available for this purpose have not been adequate. The Commonwealth of Massachusetts does not provide grants-in-aid for the construction of pollution abatement facilities. Legislation to provide grants of 20 percent of construction cost was defeated in the recent legislative session. Currently 150 of the 351 communities in Massachusetts are in areas eligible for Area Redevelopment Administration or Accelerated Public Works programs. It is necessary to assist such communities to provide water pollution abatement facilities. To this end we should entertain seriously legislation to provide State grants-in-aid for the construction of such facilities.

"The Connecticut River in Massachusetts has to a large extent been classified under the provisions of the New England Interstate Water Pollution Control Commission. The unclassified areas will be classified as soon as practicable, taking into consideration the requirements of our upstream neighbors for legislative action. When classified the

"Commonwealth is pledged to require the installation of sewage and industrial waste pollution abatement facilities essential to meeting the stream classifications.

"Since the program of pollution abatement is of such importance to the health and welfare of the citizens of Massachusetts the entire program will be carried forward with vigor. This conference, the U.S. Public Health Service and the Department of Health, Education, and Welfare will receive every cooperation from the Department of Public Health and other agencies interested in providing clean waters for the Commonwealth of Massachusetts."

MR. STEIN: Thank you, Mr. Taylor.

At this point, if there are no further statements, we would like to call on Mr. Rogers for the Department of Health, Education, and Welfare presentation.

Mr. Rogers.

MR. ROGERS: The Federal Government presentation in this conference, called under Section 8 of the Federal Water Pollution Control Act, includes participation of those Federal agencies having an interest in the water uses and pollution of the water of the Connecticut River Basin in Massachusetts and Connecticut.

The Department of Health, Education, and Welfare has developed a report on pollution of interstate waters of the Connecticut River in these two States. Mr. F. W. Kittrell of the Robert A. Taft Sanitary Engineering Center will present this report at this time.

STATEMENT OF
FRANCIS W. KITTRELL
UNITED STATES DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
ROBERT A. TAFT SANITARY ENGINEERING CENTER
CINCINNATI, OHIO

MR. KITTRELL: Mr. Chairman, conferees, ladies and gentlemen:

INTRODUCTION

On the basis of reports that gave him reason to believe that pollution of the Connecticut River in Massachusetts was endangering the health or welfare of persons in Connecticut, the Secretary of Health, Education, and Welfare called a conference of the Public Health Service and the State and interstate water pollution control agencies concerned, to be held in Hartford, Connecticut, on December 2, 1963.

This report on pollution of interstate waters of the Connecticut River is based on previous reports; data and other material obtained from the Massachusetts Department of Public Health, the Connecticut Water Resources Commission, and the New England Interstate Water Pollution Control Commission; information furnished by other interested State and local agencies and individuals; official records of the Public Health Service; and data obtained by the Public Health Service through a study conducted during the period September 30 through October 11, 1963.

The Massachusetts Department of Public Health provided a boat, participated in the preliminary reconnaissance of the river and the collection of samples, and sampled and analyzed sewage at the treatment plants. The Connecticut Board of Fisheries and Game furnished a boat and assisted in sampling. The Springfield, Massachusetts, Bondi Island Sewage Treatment Plant provided space and utilities for the Public Health Service mobile laboratory.

The wholehearted and invaluable cooperation of the numerous agencies and individuals is gratefully acknowledged.

THE AREA

The Connecticut River is the major interstate stream of the New England States. Rising in the northern tip of New Hampshire near the Canadian border, the river flows south for nearly 400 miles to join the Atlantic Ocean in Long Island Sound. It forms the boundary between New Hampshire and Vermont and travels across both Massachusetts and Connecticut on its way to the sea.

From headwaters to mouth the river drops nearly one-third of a mile. Formerly it tumbled over many rocky rapids, but most of these either have been buried beneath impoundments created to produce power, or have been by-passed with canals constructed to permit navigation and to conduct water to manufacturing plants for production of power and for use in industrial processes. Other means of transportation have largely replaced navigation, but the canals still serve as sources of power and water supply for industries.

The Connecticut, viewed at a distance, is a beautiful river. Its broad expanses of water flowing in sweeping bends between tree-lined banks, through both impounded

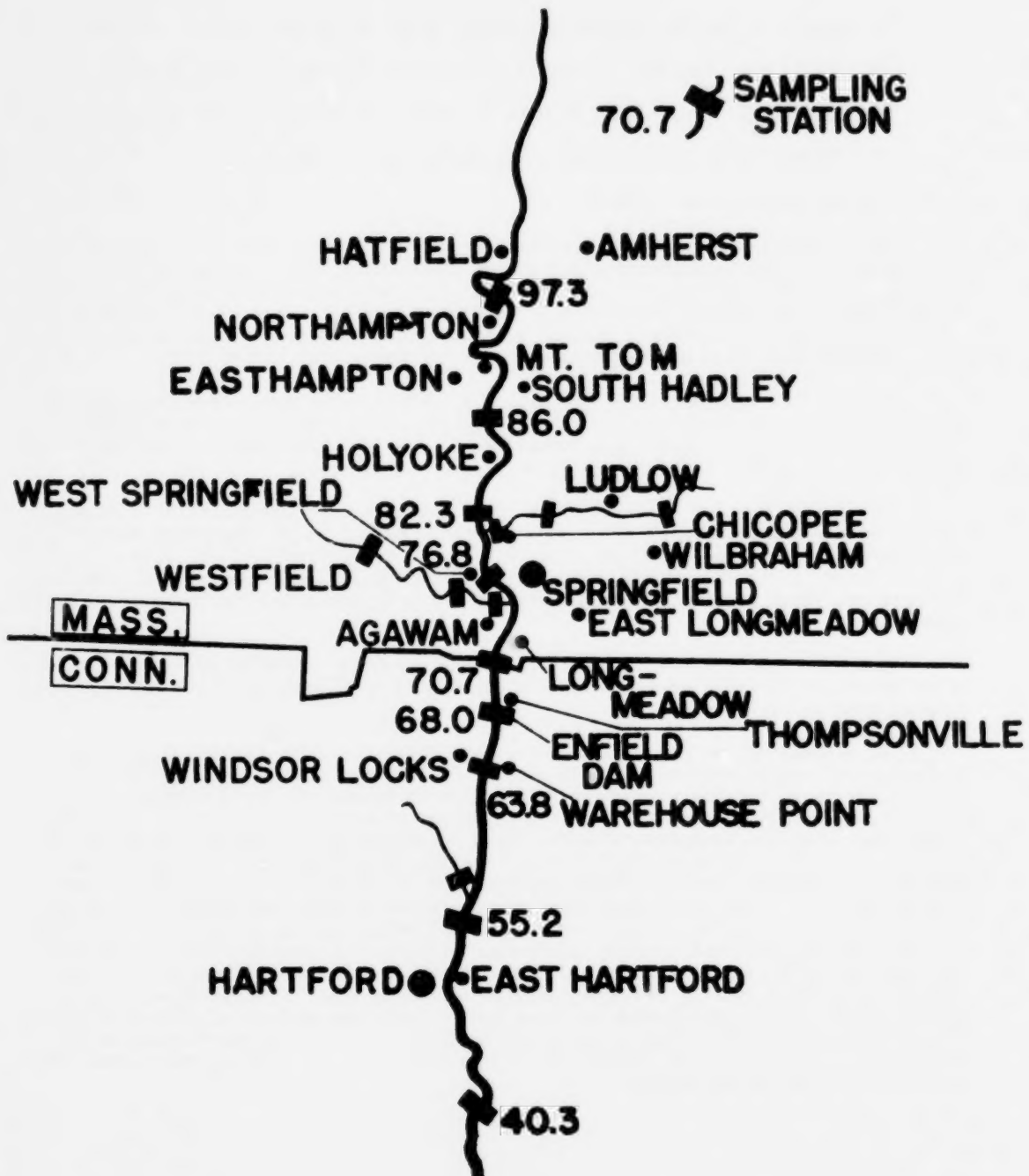
and uncontrolled reaches, enchant the eye. The quiet impounded waters invite pleasure boating, swimming and skiing. The free-flowing reaches challenge the canoeist and the fisherman. The potential for recreation is great, but has not yet been fully realized. In some areas, when viewed at close range, the ugly evidences of pollution disenchant the esthetic sensibilities, and dampen enthusiasm for contact with the water. As a result the Connecticut River has achieved a reputation locally as a dirty, polluted stream, and this inevitably has interfered with its development and use for recreation.

The 62-mile reach of the river (Figure 1) covered by this report extends from Hatfield, Massachusetts, to the Rocky Hill-South Glastonbury Ferry, 12 miles below Hartford. Of this reach, 32 miles are in Massachusetts and 30 in Connecticut. Thirty-eight miles are impounded by the Holyoke and Enfield dams, eight miles are free-flowing, and 16 miles are subject to tidal fluctuation.

(Figure 1 is as follows:)

CONNECTICUT RIVER

FIGURE 1



MR. KITTRELL: Portions of two major tributaries which receive sewage and industrial wastes in Massachusetts, and enter the Connecticut near Springfield, also are covered in this report. These are the Chicopee River from North Wilbraham to its mouth, and the Westfield River from Westfield to its mouth. Like the Connecticut, both of the tributaries have been developed to provide power and water supply for industry. The 12.5-mile reach of the Chicopee is a series of six impoundments totaling about 10 miles in length, separated by brief stretches of free-flowing water. The 11.5-mile reach of the Westfield River includes two small impoundments and about 11 miles of open stream.

As members of the New England Interstate Water Pollution Control Commission --

MR. STEIN: Mr. Kittrell, I notice you are not reading the full report.

MR. KITTRELL: I would like to have the full report entered into the conference.

MR. STEIN: It will be entered in as read, without objection.

You may proceed, Mr. Kittrell.

MR. KITTRELL: Along the three-stream reaches in Massachusetts are 15 towns, one village (Mt. Tom -- although a portion of Easthampton, this village is listed separately in official inventories) and a Federal Air Force Base discharging sewage from an estimated total sewered population of 428,400. Seven of these towns and the village, with an estimated total sewered population of 146,200, discharge sewage without treatment. Springfield, with primary treatment, is the major city of the area.

Within this same area 10 paper mills, a textile mill, three metal working plants, three synthetic chemical plants, a rendering plant and a brewery discharge industrial wastes to the streams. The oxygen demand population equivalent (PE) of the industrial wastes from all plants is estimated to be 96,900.

Along the reach of the main river in Connecticut are five jurisdictions, with an estimated total sewered population of 305,800. One of these (Warehouse Point -- about two-thirds of the sewered population are in a State institution), with a sewered population of 1,240, discharges sewage without treatment. The major city of the area is Hartford, which provides primary treatment for a major portion of the metropolitan area.

Only one industry discharges a significant quantity of waste to the Connecticut River above the Hartford area. This is a paper mill with an estimated organic population equivalent of about 500.

As members of the New England Interstate Water Pollution Control Commission, Massachusetts and Connecticut in 1955 classified the Connecticut River in the two States. At that time the river from Holyoke Dam in Massachusetts to Middletown, Connecticut, was judged to be in the condition described by Class D of the Interstate Commission, with the exception of a few miles above Hartford, which was judged to be Class C. The uses for which Class D water quality is suitable are "transportation of sewage and industrial wastes without nuisance and for power, navigation and certain industrial uses." The Commission approved the future highest use classification of the river from Holyoke to Hartford as C. Class C water quality is described as being suitable for recreational boating, irrigation of crops not used for consumption without cooking; habitat for wildlife and common food and game fishes indigenous to the region; industrial cooling and most industrial process uses." Among other requirements, Class C waters shall have not less than 5 parts per million of dissolved oxygen. Oil, grease, color and turbidity shall not be objectionable, and there shall be no odor, scum, floating solids, debris and sludge deposits. No limiting values have been imposed on bacterial pollution.

At the time the classification was adopted, five of the towns involved along the Massachusetts reach of the river had sewage treatment. In the eight years since that time three additional towns with a sewered population of 55,500 have provided treatment, and two of the original plants have been rebuilt or replaced. Eight jurisdictions with a sewered population of 146,200 still are without treatment.

It has been reported that Massachusetts towns, hard-hit by the loss of numerous industries, have delayed sewage treatment in hopes of more financial assistance through Federal or State grants.

Generally industries have been unwilling to provide treatment before the towns. There has been hesitancy in placing pressure on the industries because of concern that this might hasten their removal from the State.

WATER USES

Along this 62-mile reach the Connecticut River is used principally for industrial water supply, recreation, power production and waste disposal. There is some navigation and commercial fishing.

INDUSTRIAL WATER SUPPLY

The Connecticut provides such an abundance of water for industrial supply in this reach that the industries are said not to bother with records of water use. Previous attempts to assemble such data have been unsuccessful.

At Holyoke an intricate system of three canals at different levels traverses the city to carry water directly to the numerous industries located along the canals. Five paper mills, which lead the nation in production of writing paper and are large users of water, draw their supplies from these canals. Several industries in West Springfield take water from the Connecticut River. A canal parallels the river from Enfield Dam for five miles downstream to Windsor Locks where it furnishes power and water supply for several industrial plants.

The Chicopee River furnishes water to industries in Springfield, Chicopee and Chicopee Falls, and the Westfield River is the source of supply for industries in Westfield and West Springfield.

Four thermal power plants use large quantities of Connecticut River water for cooling. Two of these alone use about 317 million gallons per day.

The Pratt and Whitney Division, United Aircraft Corporation, at East Hartford, uses 720 million gallons of water per day for cooling.

In Connecticut above Hartford one large paper mill uses several million gallons of river water per day from Windsor Canal. Several small industries draw limited quantities of water from the canal also.

RECREATION

The very real potential of this reach of the Connecticut River for recreational uses has not fully been realized. Of all existing uses, fishing for shad during the spring run of this anadromous fish is the most popular and attracts the most attention. In step with the trend throughout the nation, pleasure boating is increasing in popularity as a water sport, though it has not developed as rapidly as it has elsewhere.

Fishing

From late April through early June of each year large numbers of shad travel up the Connecticut River to spawn. During these runs sport fishermen take to the river to catch their share of these fighting fish. By all accounts, this period of the year witnesses the most intensive recreational use of this reach of the Connecticut. It has been said that one almost could cross the river by stepping from fishing boat to fishing boat in some areas when the shad run is on. Many fishermen line the banks near access points, and others crowd suitable bridges.

About one-third of the shad fishing is concentrated at eight State-controlled areas from the mouth of the Farmington River to South Hadley Bridge in Holyoke. Six of these are in Connecticut between Enfield Dam and the Farmington River, and two are in Massachusetts. Information compiled from the controlled areas provides the basis for the data below.

For the 10-year period from 1953 through 1962, during the few weeks of the shad run each year, sport fishermen spent an average of about 19,000 man-days per year in pursuit of the shad. The success of their efforts is reflected by the average of 27,200 shad taken each year. In 1963 the man-days reached a high of about 26,000, with a record catch of 52,000.

River flow usually is high at the time of the shad run each year, and the fish are able to pass the low Enfield Dam through a special runway near one end of the dam. At the higher Holyoke Dam they need assistance to continue upstream, and this is provided by the Holyoke Water Power Company, which operates an elevator-type fishway or lift to serve their finny passengers. The aquatic elevator was first operated in 1955, when 4,900 shad were transferred from the river below to the impoundment above the dam. The patronage of the elevator has steadily increased since then, with 30,000 shad riding it over the dam in 1963 to continue to spawning grounds in the Holyoke impoundment and its tributaries. This year shad were taken as far upstream as Deerfield Dam, which bars their further passage.

The Connecticut River supports a variety of game and coarse fish. These include yellow perch, bullhead, white and channel catfish, large-mouthed bass, chain pickerel, white perch, northern pike, carp and suckers. For some unexplained reason there has been only limited angling for any type of fish other than shad. A former Chief of the Division of Fisheries, Connecticut Board of Fisheries and Game, puzzled by the limited use of this excellent fishery, has hypothesized that, "It may be possible that many sportsmen associate the river with gross pollution and uncleanness and feel it unlikely to consider sport fishing in such an environment -- further, that fish from the river are unfit as food." He added, however, that shad, which are intolerant of poor water quality, are again prospering in the river. Fortunately, adult shad ascend the river when flows are high and are not subjected to the most critical effects of pollution. The young shad feed on suspended microscopic plants and animals and are not dependent on bottom organisms for food. The semi-buoyant shad eggs move with the river current and do not rest on the sewage sludge where it covers the river bottom.

Boating

The greatest use of the river for pleasure-boating occurs in the Holyoke impoundment in the Northampton area and in the tidal reach of the river below Hartford. A limited amount of boating is reported in the tidal reach above Hartford, and in the Enfield impoundment. There is no channel suitable for motor-boating between Enfield Dam and tidewater, and there are channel restrictions in the Enfield impoundment.

In the Holyoke impoundment between the dam and Northampton there are two commercial boat ramps and docking facilities, a mooring area, and a canoe club. A water skiing club patronizes one of the commercial marinas. There are three commercial ramps and moorages for pleasure boats, and a yacht club in the Enfield impoundment between the State line and Holyoke.

Four public access areas in Connecticut accommodate pleasure boats between the State line and Hartford. These are designated as Thompsonville, Enfield, Windsor and Wilson. The Connecticut Board of Fisheries and Game has plans for providing more public access areas and better facilities to encourage increased use of the excellent fishery available in this reach of the river.

Two commercial agencies rent boats to shad fishermen just below Windsor Locks.

Swimming

Only one bathing beach was noted in the area under consideration. This was at the boat ramp and moorage at Northampton. Where there is suitable water, however, some of those who live near the stream, some pleasure boaters and fishermen, and some who visit the river to enjoy being near water will swim on an unorganized basis. The Connecticut River undoubtedly is no exception to this generalization.

Skiing

The tremendous national increase in popularity of pleasure-boating inevitably has been followed by an increase in water skiing. While this sport apparently has not become popular so rapidly along the Connecticut as it has on other waters, there has been a start, as evidenced by the ski club on the Holyoke impoundment. Popularity of this sport undoubtedly will increase. The quiet waters of the Holyoke impoundment and of the tidal section in the vicinity of Hartford are the most suitable river reaches for this sport, which invariably involves body contact with the water.

COMMERCIAL FISHING

Commercial shad fishing is permitted in the Connecticut River in Connecticut, but not in Massachusetts. The shad run is followed by commercial fishermen as it proceeds upstream from the mouth of the river to Enfield Dam. During the 10-year period from 1953 through 1962 commercial fishermen have netted an average of 98,200 shad yearly.

NAVIGATION

Navigation on the Connecticut is limited to the tidal reach of the river below Hartford. Several oil barges make the trip from Long Island Sound to Hartford each day, and some of the coal used for thermal power production in Hartford is transported by water.

HYDRO POWER

It is said that the entire flow of the Connecticut River during low-flow periods is used two to three times over for power production.

The principal hydro power use is at Holyoke and Windsor Locks. At Holyoke the three-canal system provides head for power to serve many of the industries. The Holyoke Water Power Company draws water from the impoundment to produce electric current. The Windsor Canal provides power for industries situated at Windsor Locks. The Chicopee and Westfield rivers also produce electric power.

During periods of low flow the entire flow of the Connecticut River, with the exception of about 200 cubic feet per second of leakage, is retained by the Holyoke Dam on Saturdays and Sundays. This two day reduction in flow each week seriously affects waste disposal in the Enfield impoundment.

SOURCES OF WASTES

Raw and partially treated sewage and industrial wastes cause excessive pollution of certain reaches of the Connecticut, the Chicopee and the Westfield Rivers in Massachusetts, and the Connecticut River in Connecticut.

SEWAGE

Sewage contains numerous constituents which may have adverse effects on water quality and uses. Of these, bacteria, suspended solids and oxygen-demanding materials generally are most important. The content of sewage from either untreated or treated sources may be described in terms of bacterial, suspended solids or oxygen demand population equivalents. The population equivalents are the sewered populations that would produce raw sewage having equivalent quantities of bacteria, suspended solids, or oxygen demand.

Nine of the 22 jurisdictions responsible for the discharge of sewage involved in this study provide no treatment. Twelve of the 22 provide primary treatment, or sedimentation, which removes only limited portions of the pollutonal constituents. One discharges both raw and primary treated sewage. Three of the primary plants are equipped to chlorinate the sewage during the recreational season. Chlorination can achieve major reductions in the bacterial content of sewage, but accomplishes little reduction in other constituents. One of the 22 jurisdictions provides secondary treatment, which includes a biological process, and chlorination. This combination of processes may accomplish the maximum reductions in all pollutonal constituents that are feasible by present conventional sewage treatment methods. All of the treatment methods permit some residual materials to enter the receiving stream.

Bacteria

The total sewered population of the 22 jurisdictions is estimated to be 734,000. The treatment presently provided is estimated to reduce the over-all bacterial content of the sewage about 44 percent, leaving bacteria equivalent to those in the raw sewage from 413,000 persons to enter the stream.

The estimated bacterial loads from the various sources of sewage, with estimated allowances for any treatment provided, are presented in Table 1. The loads are expressed in terms of bacterial population equivalents (BPE). A bacterial population equivalent may be defined as the quantity of coliform bacteria contributed to a stream by the daily untreated sewage discharge from one person.

(Table 1 is as follows:)

**CONNECTICUT RIVER
MASSACHUSETTS-CONNECTICUT**

TABLE 1

Estimated Characteristics of Sewage Discharged to Connecticut River
and Tributaries between Northampton, Massachusetts, and South
Glastonbury-Rocky Hill Ferry, Connecticut.

JURISDICTION	STATES	RECEIVING STREAM	Type of System*	Type of Treatment	Sewered Population	Population Equivalents Discharged			
						Bacterial Number	Suspended Solids	Oxygen Demand	Total
						\$ Total	\$ Total	\$ Total	\$ Total
Hatfield	Mass.	Mill River	C	None	1,300	1,300	0.29	1,300	0.23
Acherst	Mass.	Connecticut River	S	Primary and CI	16,000	1,200	0.29	4,290	1.24
Northampton	Mass.	Connecticut River	S	Primary and CI	30,000	2,250	0.54	10,000	3.35
Mt. Tom	Mass.	Connecticut River	S	None	200	200	0.04	200	0.04
East Hampton	Mass.	Connecticut River	S	Primary and CI	11,100	830	0.20	4,440	1.54
South Hadley	Mass.	Connecticut River	C	Primary	15,500	7,750	1.88	3,120	0.75
Holyoke	Mass.	Connecticut River	C	None	52,500	52,500	12.72	52,500	9.39
West Springfield	Mass.	" & Chicopee River	C	None	22,445	22,445	5.43	22,440	4.01
Springfield	Mass.	Connecticut River	C	Primary	150,000	75,000	18.17	65,500	20.57
Springfield	Mass.	Chicopee River	C	Primary	16,000	8,000	1.94	10,500	3.06
Agawam	Mass.	Connecticut River	S	Primary	12,510	6,300	1.53	5,200	1.17
Agawam	Mass.	Connecticut River	S	None	2,000	2,000	0.46	2,000	0.36
Longmeadow	Mass.	Connecticut River	S	Primary	10,000	5,000	1.21	4,900	1.68
Ludlow	Mass.	Connecticut River	S	Primary	4,400	2,200	0.53	15,600	3.13
Wilbraham	Mass.	Chicopee River	-	None	480	480	0.11	480	0.09
Westover Air	Mass.	Chicopee River	S	Primary	9,000	4,500	1.09	4,950	1.04
Force Base	Mass.	Chicopee River	C	None	52,000	52,000	12.59	52,000	9.30
Chicopee	Mass.	Westfield River	C	None	15,300	15,300	3.71	15,300	2.74
Westfield	Mass.	Pecousic Branch	S	Secondary and CI	7,700	120	0.03	1,080	0.24
E. Longmeadow	Mass.				426,435	259,370	62.8	275,860	64.4
TOTAL MASSACHUSETTS									
Thompsonville	Conn.	Connecticut River	S-C	Primary	13,500	6,750	1.63	7,420	1.57
Warehouse Point	Conn.	Connecticut River	S	None	1,240	1,240	0.30	1,240	0.22
Windsor Locks	Conn.	Connecticut River	S	Primary	8,500	4,250	1.03	4,680	0.99
Hartford	Conn.	Connecticut River	C	Primary	256,290	128,150	31.04	140,900	29.78
East Hartford	Conn.	Connecticut River	S	Primary	26,300	13,150	3.18	14,500	3.06
TOTAL CONNECTICUT					305,830	153,540	37.2	168,740	35.6
TOTAL ALL SOURCES					734,265	412,910		444,600	99.010

* Type of System:

S = Separate Sewers
C = Combined Sewers

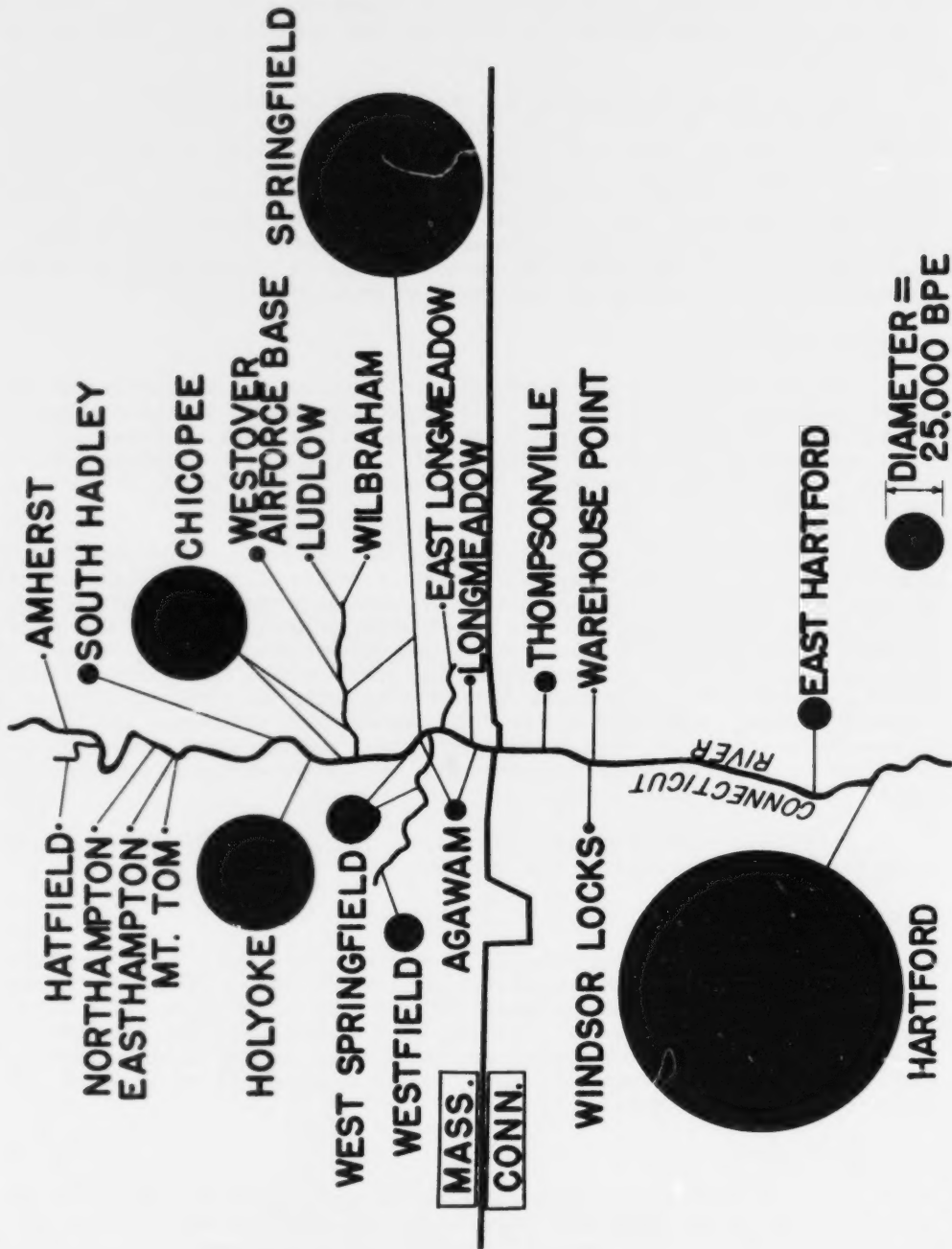
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MR. KITTRELL: The data in Table 1 are shown graphically in Figure 2. This figure provides a visual impression of the relative proportion of the total bacterial load discharged from each source of sewage. The diameters of the circles are in proportion to the loads from the various jurisdictions. The diameter of the circle representing the scale is equivalent to the bacterial contribution of raw sewage from 25,000 persons.

(Figure 2 is as follows:)

ESTIMATED BACTERIAL LOADS

FIGURE 2



MR. KITTRELL: Of the estimated total bacterial load, 63 percent is discharged in Massachusetts and 37 percent in Connecticut. Raw sewage discharges account for 36 percent of the total and sources with only primary treatment account for 63 percent. The four towns that provide chlorination are responsible for only 1.2 percent of the total during the recreation season, although they contain nearly 9 percent of the sewered population.

The two cities that account for the largest individual bacterial loads provide primary treatment. Hartford is the largest single source, with 31.0 percent, or nearly one-third, of the total from all sources. Springfield is second, with 20.1 percent. The next four towns, all in Massachusetts, provide no treatment. Holyoke accounts for 12.7 percent, Chicopee 12.6 percent, West Springfield 5.4 percent, and Westfield 3.7 percent. East Hartford, with primary treatment, accounts for 3.2 percent. Of the remaining 15 jurisdictions, three of which provide no treatment, none discharges more than two percent of the total. The 15 jurisdictions combined are responsible for 11.3 percent of the total bacterial load.

Suspended Solids

The raw sewage from all sources is estimated to have a suspended solids population equivalent (SPE) of 747,000. The previously described treatment by 15 of the 22 jurisdictions reduces the combined suspended solids about 40 percent, to leave a total suspended solids population equivalent of 445,000 to be discharged to the stream. At 0.2 pounds of suspended solids per capita per day this is equal to 89,000 pounds per day.

The percentages of the total suspended solids load from all jurisdictions are given in Table 1. The percentages from each of the two States, the percentages from systems with and without treatment, and the relative proportions from the individual sources are quite comparable to those for bacterial loads, with four exceptions. The chlorination of Northampton, Easthampton, and Amherst sewage, which reduces those bacterial loads to very low percentages, has little effect on suspended solids reduction. Northampton, which ranks fourteenth in bacterial load, moves up to ninth in suspended solids. East Hampton goes from nineteenth to fifteenth, and Amherst from eighteenth to sixteenth. Ludlow has a relatively small sewered population, and is fifteenth in bacterial load, but apparently receives considerable industrial waste and is sixth in suspended solids.

With these exceptions, the proportional suspended solids loads are similar to those for bacteria illustrated in Figure 2.

Oxygen Demand

The raw sewage from all sources is estimated to exert a 5-day biochemical oxygen demand (B.O.D.) equal to a population equivalent (PE) of 764,000. The Treatment provided reduces the combined oxygen demand about 27 percent, leaving a PE of 559,000 to be discharged to the receiving streams. The percentages from each of the two States, the percentages from raw and treated sewage, and the relative proportions from individual sources are similar to those for suspended solids and it would be repetitious to give details here.

INDUSTRIAL WASTES

The industrial plants discharging wastes directly to the reaches of the Connecticut, Chicopee and Westfield rivers under consideration add little to the total bacterial pollution of the streams. Sewage from the employees is discharged without treatment at some of the plants. Since most of the employees live in nearby sewered communities, their sewage would reach the river through municipal systems if it were

not discharged through the plant sewers. As municipal sewage treatment plants become available the sewage from the plant employees will be connected to the municipal systems or will be treated at the industrial plants.

Some of the industrial wastes have two constituents, oxygen demand and suspended solids, in common with sewage. Other waste constituents, which may have local but not interstate significance, are metals, dyes, acids and alkalies.

The 20 industries that discharge directly to streams are listed in Table 2. Included is information on waste constituents provided by the State Water pollution control agencies, obtained from Public Health Service records, or estimated on the basis of assumptions that are believed to be reasonable.

(Table 2 is as follows:)

CONNECTICUT RIVER
MASSACHUSETTS-CONNECTICUT

TABLE 2

Estimated Characteristics of Industrial Wastes Discharged to Connecticut
River and Tributaries between Northampton, Massachusetts and
Hartford, Connecticut

PLANT	LOCATION	CLASSIFICATION	RECEIVING STREAM	TYPE OF TREATMENT	Paper Mill Fiber		Oxygen Demand	
					Pounds per Day	\$ Total	Population Equivalent Number	\$ Total
Texon, Inc. American Writing Paper Corp. Chemical Paper Mfg. Co. Franklin Paper Co. Valley Paper Co. Whiting and Co. Springfield Rendering Randen-Harvard Brewing Co. Utility Mfg. Co. Shavonian Resins Corp. Thal Dyeing Co. Monsanto Chemical Co. U. S. Rubber Foster Machine Co. Stevens Paper Mill Westfield Mfg. Permold Corp. Strathmore Paper Co. Southworth Co.	South Hadley, Mass.	Paper Mill	Connecticut River	None	900	3.88	430	0.44
	Holyoke, Mass.	Paper Mill	Connecticut River	Save-alls	4,800	20.69	10,000	10.27
	Holyoke, Mass.	Paper Mill	Connecticut River	None	7,500	32.33	5,750	5.90
	Holyoke, Mass.	Paper Mill	Connecticut River	None	2,100	9.05	900	0.92
	Holyoke, Mass.	Paper Mill	Connecticut River	Save-alls	600	2.59	3,000	3.08
	Holyoke, Mass.	Paper Mill	Connecticut River	None	1,800	7.76	3,200	3.29
	Chicopee, Mass.	Rendering	Connecticut River	Flotation	-	-	5,000	5.13
	Chicopee, Mass.	Brewery	Connecticut River	None	-	-	2,100	2.16
	Wilbraham, Mass.	Misc. Metals	Chicopee River	None	-	-	-	-
	Springfield, Mass.	Chemical	Chicopee River	None	-	-	24,600	25.25
	Springfield, Mass.	Wool Dyeing	Chicopee River	None	-	-	1,240	1.27
	Springfield, Mass.	Chemical	Chicopee River	Phenol Recovery	-	-	10,500	10.78
	Springfield, Mass.	Synthetic Rubber	Chicopee River	None	-	-	9,200	9.44
	Westfield, Mass.	Machining	Westfield River	None	-	-	-	-
	Westfield, Mass.	Paper Mill	Little River	None	3,000	12.93	10,000	10.27
	Westfield, Mass.	Metal Plating	Westfield River	None	-	-	-	-
	W. Springfield, Mass.	Paper Mill	Westfield River	Save-alls	900	3.88	3,000	3.08
	W. Springfield, Mass.	Paper Mill	Westfield River	Save-alls	500	2.15	7,600	7.80
	W. Springfield, Mass.	Paper Mill	Westfield River	Save-alls	200	0.86	400	0.41
TOTAL MASSACHUSETTS					22,300	96.1	96,920	99.5
C. H. Dexter and Sons, Inc.	Windsor Locks, Conn.	Paper Mill	Connecticut River	None	900	3.88	500	0.51
TOTAL CONNECTICUT					900	3.9	500	0.5
TOTAL ALL SOURCES					23,200		97,420	

MR. KITTRELL: Suspended Solids.

Suspended solids data as such are not available from official records, and cannot readily be estimated for most of the plants.

The combined losses of fiber by the 11 paper mills probably constitute the major industrial organic suspended solids load discharged to the streams. Estimates of plant capacities were derived from Lockwood's Directory of the Pulp and Paper Industry. It was assumed that plants with save-alls lose one percent of the pulp used, and those without save-alls lose three percent of the pulp. While an estimate for an individual mill may not be accurate, it is believed that the total for all mills is reasonable. The probability is that the total is conservative.

The total fiber loss for the 10 mills in Massachusetts is estimated to be 22,300 pounds per day. This is about 40 percent of the estimated suspended solids load of 55,200 pounds per day discharged by all sources of sewage in the area of Massachusetts under consideration. Of the fiber loss 75 percent of the total is estimated to be discharged by the five paper mills in Holyoke, 13 percent by the mill in Westfield, 7 percent by the three in West Springfield, and 4 percent by that in South Hadley.

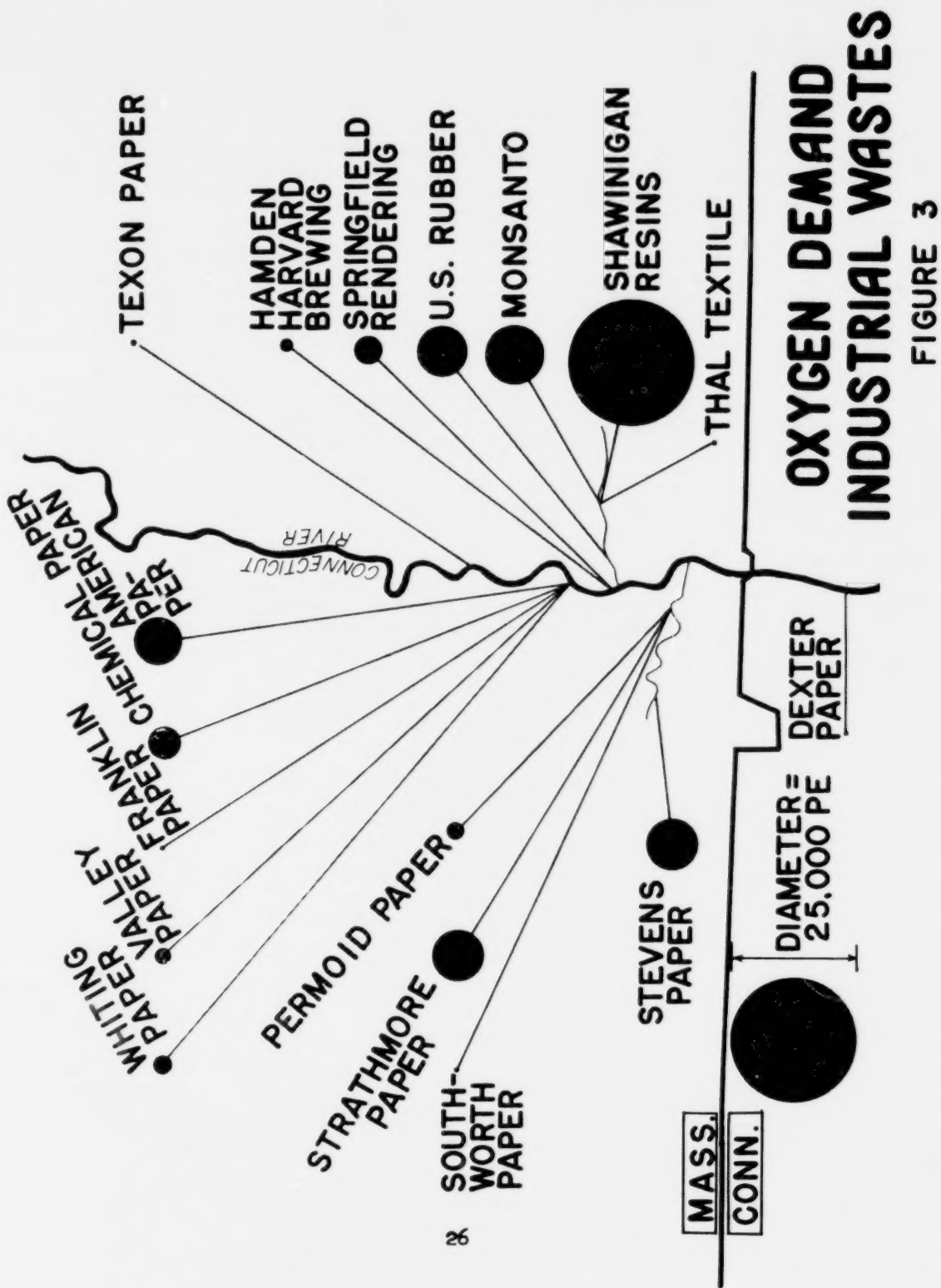
The single paper mill in Connecticut, at Windsor Locks, is estimated to discharge 900 pounds of fiber per day, which is 2.7 percent of the 33,700 pounds per day of suspended solids discharged by sources of sewage in Connecticut.

The estimated suspended solids from all sources of sewage in the study area plus the estimated fiber losses from paper mills have a total SPE of 551,000.

Oxygen Demand

The industrial wastes of the study area above Hartford have a total estimated PE of 97,400. The relative sizes of the loads from individual sources are shown in Figure 3. Of this, 99.5 percent enters the streams in Massachusetts, and 0.5 percent in Connecticut.

(Figure 3 is as follows:)



MR. KITTRELL: In Massachusetts, 54 percent of the industrial wastes PE is discharged to the Chicopee River in the Chicopee-Springfield area, 24 percent to the Connecticut at Holyoke, and 22 percent to the Westfield and Little Rivers in the Westfield-West Springfield area.

The 10 paper mills as a group contribute 46 percent of the total, the three synthetic chemical plants, 46 percent, and the rendering, brewing and textile plants a combined 8 percent.

The single paper mill in Connecticut above Hartford accounts for the total 550 PE of industrial wastes involved in that State.

The PE of all sewage and industrial wastes combined discharged to the streams in both States totals 656,000, which is only 78,000 less than that of all sewage before treatment.

EFFECTS OF POLLUTION ON WATER QUALITY AND USES

Excessive bacterial pollution of a stream presents a health hazard to those who come in contact with the water. Excessive suspended solids diminish the beauty of water and settle to and blanket the stream bottom, where they form sludge deposits which can produce offensive odors, reduce or eliminate aquatic life on which fish feed, and interfere with fish spawning. Excessive oxygen demand reduces the dissolved oxygen of the water, which results in reduction or destruction of desirable aquatic life, including fish, and may produce offensive odors.

The data collected during the study to measure the effects of pollution are summarized in the Appendix. Table I-A is a list of sampling stations. Tables II-A incorporates the average values of the bacteriological, chemical and physical determinations. Table III-A lists the biological findings.

BACTERIAL POLLUTION

Municipal sewage contains enormous numbers of bacteria, among which there usually are pathogenic bacteria, derived from human excreta, that can cause gastrointestinal diseases such as typhoid fever, diarrhea and dysentery. These pathogenic bacteria, in densities too low to be detected by available laboratory methods, can cause illness in persons who swallow water containing them. As the densities of pathogenic bacteria are reduced by sewage treatment, dilution or forces of natural purification, the hazards of contracting disease are proportionately reduced.

Sewage also contains bacteria of the coliform group which typically occur in excreta, or feces, and can readily be detected even at low densities. These bacteria, harmless in themselves, are determined in stream studies involving sewage pollution as indicators of the probable presence of pathogenic bacteria. In the absence of adequate methods for detection in streams of other pathogenic organisms, such as viruses, coliform bacteria also serve as indicators of the probable presence of these organisms.

For many years the laboratory method for determination of the coliform group has been a principal tool used by sanitary engineers in evaluating bacterial pollution of streams. The coliform group has been used by numerous State and interstate water pollution control agencies as a basis for water quality objectives for various water uses. Unfortunately the coliform group includes several types of bacteria which may come from sources other than excreta, and coliform data sometimes have been challenged because of this. In the last few years a method for specific detection of fecal coliform bacteria only has been developed. Although the method has the

decided advantage of specificity, it has not been in use long enough to serve as a basis for quantitative water quality objectives. Both methods of bacterial measurement were applied to all samples in this study.

The results of both determinations are expressed in terms of most probable number, or MPN, per 100 milliliters (ml) of water. One hundred ml is a little less than one-half cup. The coliform group usually is designated as total coliforms.

Neither Massachusetts nor Connecticut has adopted a total coliform objective of water quality for recreational uses such as boating and fishing. Where such an objective has been adopted the commonly used limit is 5,000 per 100 milliliters (ml) of water.

Both States have total coliform objectives for Class B waters, suited for body contact sports such as swimming and skiing. The Massachusetts limit is a mean of 2,400 per 100 ml, and the Connecticut limit a mean of 1,000 per 100 ml. The latter limit was originated in Connecticut in studies of salt water bathing areas, and subsequently has become the natural bathing water objective most generally used by water pollution control agencies.

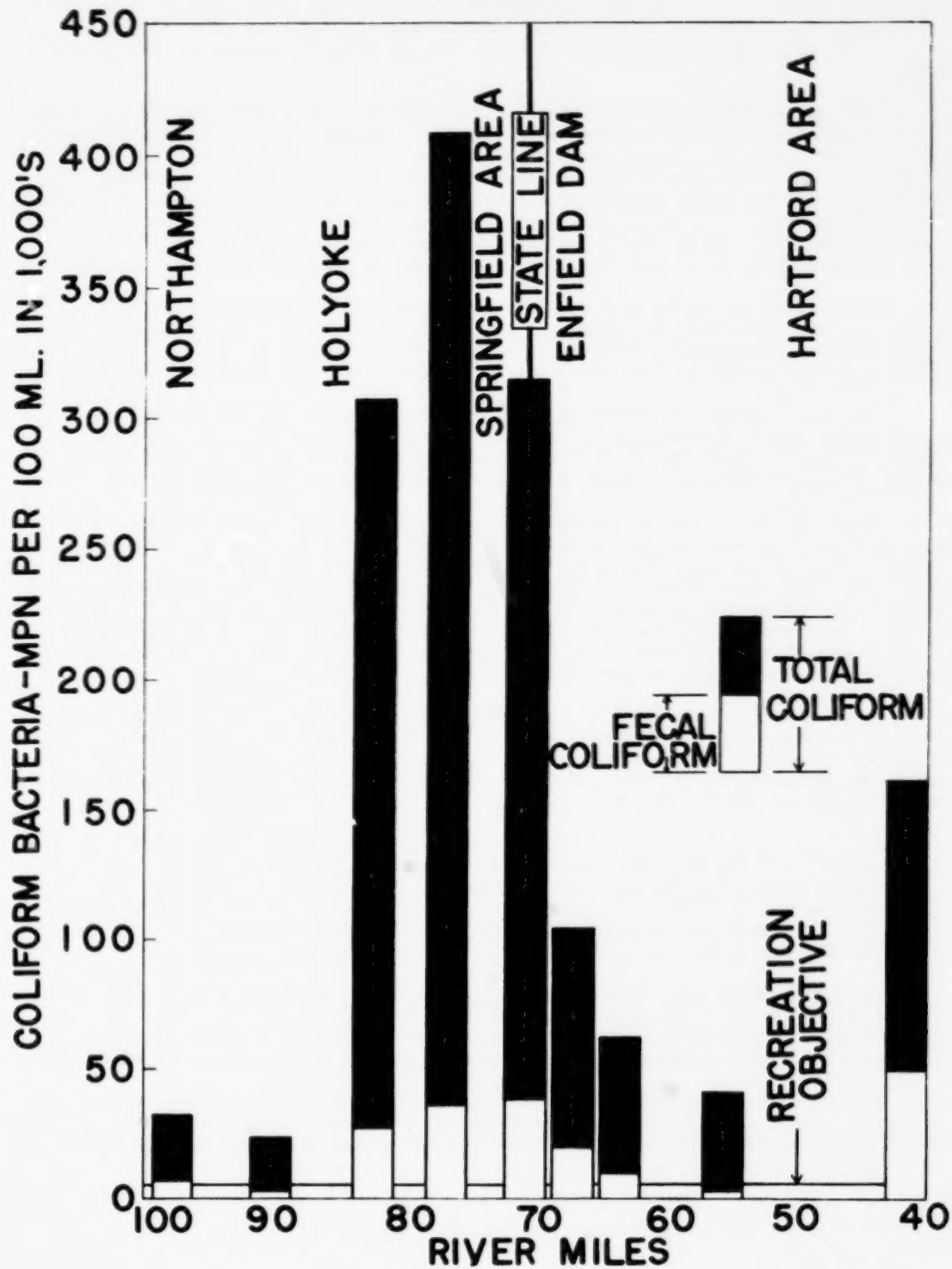
During the period September 30 through October 11, 1963, water samples from nine stations on the Connecticut River (Figure 1) were examined daily for total coliform and fecal coliform bacteria. Samples from three stations on the Chicopee River, three on the Westfield, and one on the Farmington were examined at the same time. Ten results were obtained at most stations on grab samples collected on Monday through Friday of each of the two weeks.

The average MPN values for both total and fecal coliform bacteria in the Connecticut River are plotted in Figure 4.

(Figure 4 is as follows:)

COLIFORM BACTERIA

FIGURE 4



MR. KITTRELL: Included on the chart is a line at the MPN value of 5,000 per 100 ml. This line permits comparison of the values found in the Connecticut River with the total coliform water quality objective most commonly used for general aquatic recreation, exclusive of body contact sports. The 2,400 and 1,000 per 100 ml lines representing the objectives of Massachusetts and Connecticut for swimming would, of course, fall below the 5,000 per 100 ml line, but are omitted because of the limited space.

Just above Northampton the total coliform MPN was over 31,000 per 100 ml, which is not acceptable for either general recreation or swimming. Hatfield, with a sewered population of 1,300, discharges raw sewage a few miles above Northampton, but this source alone could not account for the density of the coliform group found here. The next three towns upstream, Amherst, Sunderland and South Deerfield, provide chlorination of their sewage, and should not cause the high density if chlorination facilities were operated effectively. Montague discharges raw sewage many miles upstream, but it is judged to be too far away to affect the result at Northampton significantly.

Towns in Massachusetts are required to chlorinate only during the recreation season, and since the recreation season had closed, Amherst, with 16,000 sewered population, was not chlorinating its primary effluent during the study period. This, together with the raw sewage from Hatfield, could account for the finding at Northampton.

The effectiveness of treatment, including chlorination, of the sewage from the 30,000 population of Northampton, is reflected by the drop in the total coliform density to approximately 23,000 per 100 ml above Holyoke. The unchlorinated sewage from Mt. Tom and Easthampton prevented an even greater decrease.

Below the raw sewage discharge at Holyoke and the Willimansett outfall of Chicopee the total coliform density soared to a peak MPN of 408,000 per 100 ml in the Springfield area, and then dropped to 315,000 per 100 ml at the State line. At this point, where the river enters Connecticut, the total coliform density was 63 times the objective for general recreation, and 315 times the Connecticut objective for swimming. The fecal coliform density here was just under 40,000 per 100 ml. Anyone ingesting a single drop of water at this point would have swallowed at least 26 bacteria that originated in excreta that entered the river in Massachusetts.

An excellent confirmation of the total coliform MPN of 315,000 per 100 ml found at the State line is available in results obtained earlier by the Massachusetts Department of Public Health. Samples were collected every hour for 36 hours from the morning of September 18, 1963, through the evening of the 19th. The average MPN of these samples was 297,000 per 100 ml.

Both the total coliform and fecal coliform densities continued to drop to the last station above the Hartford area, where they were 41,000 and 2,600 per 100 ml, respectively. The total coliform density here was about 3 times the general recreation objective and 41 times that for swimming. An estimated one-third of the total coliform density were contributed by the treated sewage from Thompsonville and Windsor Locks, and the raw sewage from Warehouse Point in Connecticut.

In the Hartford area sewage from Hartford and East Hartford caused increases in total coliform and fecal coliform densities which reached 162,000 and 50,000 per 100 ml respectively. Here a drop of water contained an average of at least 33 bacteria derived from excreta, of which not more than one probably originated in Massachusetts.

The total coliform density of the Chicopee River at North Wilbraham was 12,900 per 100 ml, and the fecal coliform a relative low of 860 per 100 ml. From here the total coliform density increased to 141,000 per 100 ml below the Springfield Indian

Orchard sewage treatment plant, and to 947,000 per 100 ml at the mouth of the Chicopee, below the raw sewage discharge from Chicopee. The fecal coliform MPN at the mouth was 116,000 per 100 ml. The bacterial densities at this point were by far the greatest found at any sampling station, and reflect the effects of raw sewage from Wilbraham and Chicopee, and of primary effluent from the Springfield Indian Orchard plant, Ludlow and the U. S. Westover Air Force Base.

On the Westfield River above Westfield the total coliform MPN was 12,300 and the fecal coliform 1,600 per 100 ml. Below Westfield the total coliform density increased to 312,000 per 100 ml, followed by a decrease to 142,000 per 100 ml at the mouth of the river. Sources of raw sewage involved were Westfield and West Springfield.

The Farmington River near its mouth yielded a total coliform density of 6,900 per 100 ml and a fecal coliform density of 2,300 per 100 ml.

The average flow of the Connecticut River during the sampling period was 3,460 cubic feet (cfs) per second. The stream flow during the shad fishing season usually is much higher, with a mean monthly flow of record of 29,000 cfs in May, which is more than 11 times that during the study. The greater flow in May would provide greater dilution of the sewage with a corresponding decrease in bacterial densities. If it be assumed that the reduction in densities would be in direct proportion to the increased dilution the total coliform densities in May would range from about 38,000 per 100 ml at the State line to 4,900 per 100 ml above Hartford. There are sound reasons to believe, however, that actual densities in Connecticut during May would be higher than those calculated by straight dilution. The higher flow of the river results in a much higher velocity, and the water travels from Holyoke and the Springfield area to Hartford and intermediate points much more quickly. Since bacteria in a stream decrease as a function of time the decreased time of passage would permit considerably higher densities than those calculated at downstream points in Connecticut.

Some support for this conclusion is afforded by data obtained by the Connecticut Water Resources Commission in 1954. Samples were collected at two-hour intervals for 24-hour periods at Thompsonville during June and August. The average total coliform density on the August sampling date was 35,400 per 100 ml when the stream flow was 6,260 cfs. In June, when the flow was nearly 50 percent greater at 9,220 cfs, the MPN also was 50 percent greater at 53,200 per 100 ml.

It is obvious that bacterial pollution discharged to the Connecticut River in Massachusetts causes a health hazard to persons who come in contact with the river for any recreational or other purpose in Connecticut as well as in Massachusetts. Hartford and East Hartford sewage contribute substantially to the excessive bacterial densities below the Hartford area.

SUSPENDED SOLIDS

Total suspended solids increased from an average of 7.0 milligrams per liter (mg/l) above Northampton to about 15.0 mg per liter below the Springfield area. This represented an increase in the load of suspended solids carried by the river of about 145,000 pounds per day, which was nearly twice as great as the estimated suspended solids load discharged from all sources in Massachusetts, including the fibers from the paper mills. There undoubtedly were more suspended solids from waste sources than are accounted for by the estimates. It was noted earlier that no estimate of total suspended solids from most industrial wastes could be made.

Despite the fact that suspended solids in the river were in excess of those accounted for the waste estimates, quantities of solids settled to the bottom of the river in the Enfield impoundment to form sludge deposits. Bottom sampling revealed

sludge worm populations from below Holyoke to Enfield Dam in Connecticut. Major sludge beds were found immediately below Holyoke and at the bend of the river upstream from the North End Bridge in Springfield. In the vicinity of the Holyoke sewers fibers deposited from the paper mills' wastes were several feet deep. Some pulp fibers were found in sludge samples collected as far downstream as Enfield Dam. Sludge collected above Springfield had a particularly strong, sour odor, which resembled that of vomitus.

An interesting observation was that of small plastic particles or beads that were found in sludge samples collected below the Chicopee River. The beads were found relatively undiminished in numbers, as far downstream as the station at the South Glas-tonbury-Rocky Hill Ferry below Hartford, 40 miles below the Chicopee River. Beads were found in the mouth of Chicopee, and it is probably that these beads were discharged to the river from one or more industries on the Chicopee River.

Volatile suspended solids represent the organic portion of the total suspended solids. This organic portion is decomposable, and accounts for the oxygen demand exerted by sludge deposits and the offensive odor of hydrogen sulfide, commonly called a rotten egg odor, given off by decomposing sludge.

The volatile solids increased from 31.1 mg/l above Northampton to 7.3 mg/l at the State line. This represents an increase of 63,600 pounds per day, which is only 17,000 pounds per day less than the estimated load of total suspended solids from all sources of wastes. The previous discussion of the unaccounted for suspended solids load probably applies as well to the volatile solids.

The organic, or decomposable, content of the sludge was attested by the gas bubbles rising to the surface of the river over the major sludge deposits, and by the rotten egg odor given off by sludge samples when collected.

The sludge deposits in the Enfield impoundment contribute to the depletion of dissolved oxygen below the desirable 5 mg/l minimum that occurs from time to time at the State line as described in the next section.

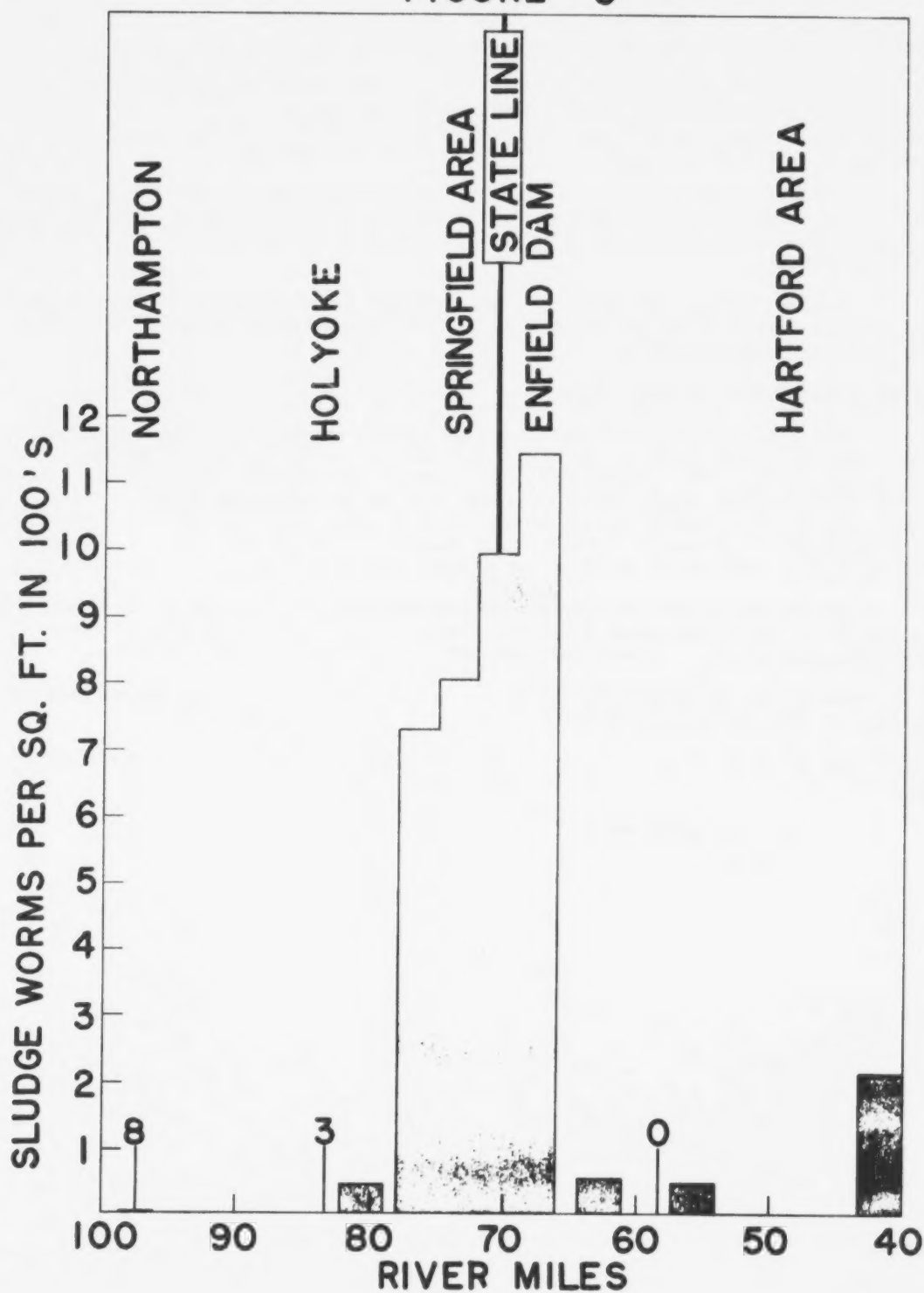
The blanket of sludge on the bottom of the river covers areas that otherwise would be used by fish in spawning, and thereby reduces the fish population below its potential. In addition, the sludge covered bottom is not a suitable habitat for the insect larvae and other aquatic life which normally live on the bed of a clean stream and serve as food for fish. Bottom aquatic organisms suitable for sport fish food were virtually nonexistent throughout the Enfield impoundment. As a result, the fish population that develops in the impoundment is limited, and consists mainly of carp and bullheads.

Among the aquatic forms which inhabit the bottoms of badly polluted streams in large numbers are sludge worms, which thrive on the organic matter in the sludge. These worms unfortunately are not suitable food for sport fish. The numbers of sludge worms per square foot of bottom area were determined at several locations, with the result shown in Figure 5.

(Figure 5 is as follows:)

SLUDGE WORMS

FIGURE 5



MR. KITTRELL: Above Northampton the river bottom was relatively clean, and only 9 sludge worms per square foot were found. Immediately below Holyoke conditions in the major sludge deposit were so foul that even the worms could not thrive and only three per square foot were found here. Downstream the worms were well established, increasing to 730 per square foot above Springfield and 994 at the State line. The maximum number found at any point was 1,134 per square foot just above Enfield Dam, which is 2.7 miles below the State line. Below the dam sludge deposits decreased and the sludge worms dropped to less than 50 per square foot, but increased to 211 per square foot below the Hartford area. In the mouth of Westfield River there were 575 sludge worms per square foot and 1,408 in the mouth of the Chicopee River.

In the areas of major sludge deposits, decomposing clumps and rafts of sludge boil to the water surface, buoyed by the gas bubbles of decomposition. These unsightly masses decrease the esthetic appeal of the stream below Holyoke and in the vicinity of Springfield.

Class C standards of water quality adopted by both Massachusetts and Connecticut require that there be no sludge deposits. Class D standards require that sludge deposits not be objectionable.

OXYGEN DEMAND AND DISSOLVED OXYGEN

Both sewage and many industrial wastes contain organic matter that decomposes and exerts an oxygen demand in the receiving stream. In the process of decomposition oxygen derived from the atmosphere and dissolved in the water is used, and the normal content of dissolved oxygen (DO) is reduced. If the DO is reduced below an adequate level, the fish population and the aquatic life on which the fish feed are reduced. Most water pollution control agencies have adopted an average of 5 mg/l as the minimum DO that is adequate to maintain the maximum potential sport fish population.

Both Massachusetts and Connecticut have adopted 5 mg/l as one of the minimum standards of quality for Class C waters. One of the definitions of Class C waters is, "suitable habitat for -- common food and game fishes indigenous to the region."

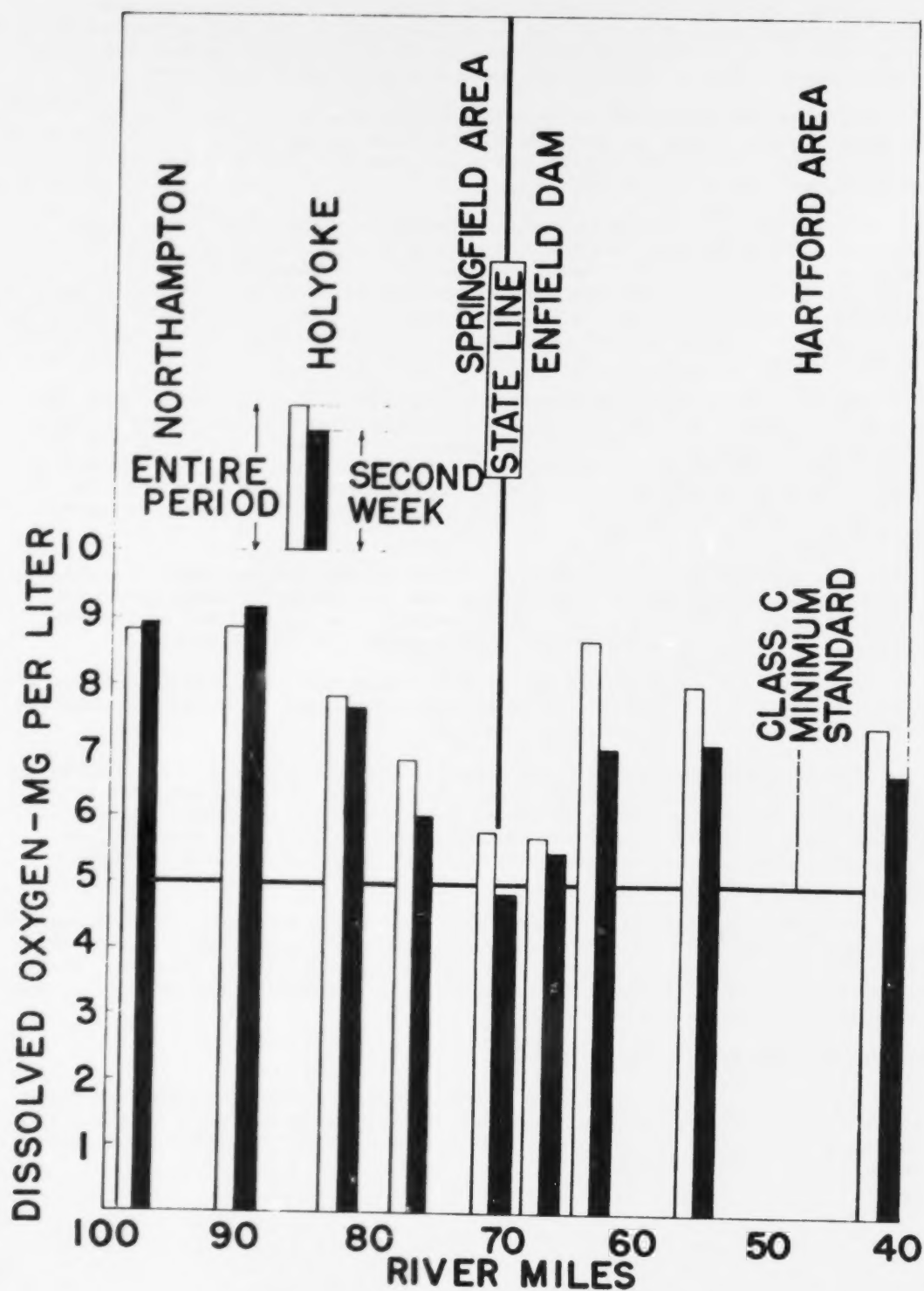
During the two-week study the B.O.D. from sources in Massachusetts reduced the average DO from 8.8 mg/l at Northampton to 5.8 mg/l at the State line.

The DO at all sampling stations on the Connecticut River is shown in Figure 6, both for the entire sampling period and for the second week only.

(Figure 6 is as follows:)

DISSOLVED OXYGEN

FIGURE 6



MR. KITTRELL: A heavy rainfall occurred the day before sampling started and as a result the stream flow was higher during the first than the second week. The average flow of 2,020 cfs for the second week was near a record minimum.

During the second week the DO increased from 8.9 mg/l above Northampton to 9.2 above Holyoke, and then dropped steadily past Holyoke and the Springfield area to 4.9 mg/l at the State line. At Enfield Dam it had increased to 5.5 mg/l and continued upward to about 7.0 mg/l above Hartford. When the river passed the Hartford area, the DO again dropped slightly to 6.8 at the South Glastonbury-Rocky Hill Ferry.

The DO at the State line was less than the standard of 5.0 mg/l on three of the five sampling dates during the second week. The three values were 4.9, 4.4 and a minimum of 4.0 mg/l. At Enfield Dam the DO was less than 5.0 mg/l on two of the 10 sampling dates, with values of 4.5 and 4.8 mg/l.

The samples at the State line were collected near noon on all dates of the second week. If it had been feasible to sample at night it is probable that even lower DO values would have been found. The Massachusetts Department of Public Health collected samples at the State line for two days and one night in September, 1963. The samples collected at 11:00 a.m. and 12:00 noon on the two days averaged 7.3 mg/l of DO. The samples from 2:00 a.m. to 5:00 a.m. averaged 5.7 mg/l, or 1.6 mg/l less than those around noon.

There is additional evidence that the DO in the Enfield impoundment drops below 5 mg/l at times. In 1956 the Public Health Service conducted an intensive study of the Enfield impoundment. At a station about two miles above the State line the DO of 13 samples collected both day and night during the period August 28 through 30 averaged 2.8 mg/l. At Thompsonville the DO samples collected every two hours for 24 hours during August 29-30 averaged 5.0 mg/l, but four early morning samples averaged only 3.3 mg/l.

The Public Health Service maintains a Water Quality Network sampling station at Enfield Dam. Samples for DO determination have been collected there weekly for about two years. On August 14, 1963, the DO reported was 4.7 mg/l and on September 5, 1962, it was 4.3 mg/l. Both results were obtained from daytime samples.

There is ample evidence that the DO at and below the State line intermittently drops below the 5.0 mg/l average that is considered necessary for optimum propagation of fish and the aquatic life on which they feed.

The organic wastes producing the oxygen demand that lowers the DO are reflected in prolific growths of minute aquatic plants and animals. From Springfield to below Windsor Locks the aquatic plants, or algae, combine with oil and other suspended and floating matter to adhere to and form unsightly scum on boats near the water line. Considerable effort and expense on the part of boat owners is required to remove the scum.

The tremendous numbers of bacteria that live on and decompose the oxygen-demanding organic matter give rise in turn to large numbers of minute aquatic animals which live on the bacteria. These animals, individually invisible to the naked eye, attach themselves to submerged surfaces from Springfield to Hartford in such masses that they appear as slimes to the unaided eye.

ESTHETIC CONSIDERATIONS

The adverse effects of floating sludge on the beauty of the Connecticut River in certain areas already has been mentioned. Other floating materials also detract from the river's beauty in some areas, and contribute to the public's opinion that the Connecticut is badly polluted.

Below Holyoke, before the sewage and other wastes are mixed with the full flow of the river, the visible effects of pollution are ever changing. The fibers and fillers from paper plants impart a turbid appearance to the water at times. At other times various colors appear below the points where canals and sewers discharge, presumably caused by dyes used in colored papers. The raw sewage causes the dull slate grey appearance typical of sewage everywhere. Bits of human excreta and small grease balls float on the surface of the water, and streaks of oil film appear from time to time.

In the vicinity of the Springfield primary treatment plant effluent small grease balls and the typical grey sewage appearance were noted. Similar evidence of sewage was observed below the Agawan sewers.

Condoms floated on the surface or lodged on obstructions along the river bank at numerous points. The farthest downstream that condoms were seen was in the vicinity of the Longmeadow Yacht Club near the State line.

The Westover Air Force Base sewage is reported to be septic at the point of discharge to Chicopee River and to cause a local odor nuisance.

COMBINED SEWERS

Nine of the municipalities, with a total sewered population of 595,000, have combined sewers. Combined systems, which are common in older municipalities throughout the country, receive both domestic sewage and storm water.

It is not economical to design sewage treatment plants to treat the large quantities of sewage and storm water which enter combined systems during storms. As a result, overflow devices are provided to by-pass portions of the mixed storm flows from the system to the nearest watercourse without treatment. Thus the raw sewage diverted during storms intermittently causes pollution of the receiving stream even after treatment for dry weather sewage flow has been provided.

Control of this type of intermittent pollution can be accomplished only by provision of separate sewers for sewage and storm water, or by the installation of large storm water treatment units as an adjunct to the principal sewage treatment plant.

RADIOACTIVITY

The Yankee Atomic Energy Company operates a commercial nuclear generating station at Rowe, Massachusetts, in the northwest corner of the State. Treated wastes are discharged under careful control to the Deerfield River, 41 miles above the confluence of the Deerfield and Connecticut Rivers. This confluence is 17 miles above the upper limit of the study area, but the possibility of radioactive pollution was investigated because of the persistence of some radioisotopes.

The Public Health Service maintains National Water Quality Networks stations on the Connecticut at Northfield, Massachusetts, above the Deerfield River, and at Enfield Dam in Connecticut. Comparison of data on gross radioactivity at these two stations has shown no evidence that the Yankee Atomic Energy Company is contributing significant radioactivity to the Connecticut River.

OTHER DETERMINATIONS

Temperature and pH determinations were made on all samples. Weekly composites were analyzed for the metals that are commonly used in metal plating. One set of samples were examined for phenols.

No significant effects of pollution other than those already discussed were indicated by the results of these determinations.

LOCAL POLLUTION

There are problems of local pollution on the Connecticut River System which are beyond the limits covered by this report. Although not judged to contribute to pollution of interstate waters, this does not imply and must not be interpreted to mean that such problems are not serious or that correction is unnecessary. On the contrary, the prospect of correction of the sources contributing to interstate pollution should stimulate others outside of the area to undertake simultaneous corrective measures so that the ultimate potential use of the priceless water resources of the Connecticut River System can soon be realized for the benefit of the citizens of both States.

SUMMARY AND CONCLUSIONS

The beautiful Connecticut River is the major interstate stream of New England. Between its headwaters near the Canadian border and its mouth, 400 miles downstream in Long Island Sound, it flows between New Hampshire and Vermont and across Massachusetts and Connecticut.

This report deals with 62 miles of the river, from Hatfield, Massachusetts, to the South Glastonbury-Rocky Hill Ferry, 12 miles below Hartford, Connecticut. Portions of the Chicopee and Westfield rivers, tributaries to the Connecticut River near Springfield, Massachusetts, are included.

This reach of the river is used principally for waste disposal, industrial water supply, hydro power, and aquatic recreation. Minor uses are commercial fishing and navigation.

Two dams, Holyoke and Enfield, on the main stream divert water to canals which serve numerous industries as sources of process water supply and hydroelectric power. Several smaller dams serve the same purposes on the Chicopee and Westfield Rivers. Four thermal power plants and an aircraft plant use more than a billion gallons of cooling water daily.

The quiet impounded waters above Holyoke dam and the tidal reach in the vicinity of Hartford invite boating, water skiing, fishing and swimming. Enfield impoundment is used for boating and fishing. At least ten boat ramps and docking areas, six in Massachusetts and four in Connecticut, provide ready access to the river between Northampton, Massachusetts, and Hartford, Connecticut.

The dramatic shad run each spring lures hundreds of fishermen to the river in both Massachusetts and Connecticut. An annual average of 19,000 man-hours spent in fishing yields an average of 27,000 shad each year. In addition, commercial fishermen in Connecticut net 98,000 shad yearly. The shad run occurs when stream flows are relatively high, and visual effects of pollution are not so obvious as they are at lower flows.

The river in Connecticut, between Enfield Dam and Hartford, supports good populations of a variety of both sport and coarse fishes. For some reason little advantage is taken of this excellent fishery. A former official of the Connecticut Board of Fisheries and Game has suggested the reason may be that many sportsmen associate the river with gross pollution and uncleanness.

This association is not without foundation. Sixteen jurisdictions in Massachusetts and five in Connecticut discharge raw and partially treated sewage from a total sewered population of nearly three-quarters of a million persons. One town in Massachusetts provides complete treatment. Reductions accomplished by treatment reduce the total loads of bacteria and suspended solids by about 40 percent and the oxygen demand about 27 percent. A little less than two-thirds of the total residual waste constituents are discharged to the streams in Massachusetts and a little more than one-third in Connecticut.

In addition, industries discharge suspended solids and oxygen-demanding materials estimated to be equivalent to those in raw sewage from a sewered population of about 100,000.

The combination of sewage and industrial wastes causes excessive pollution of the Connecticut River. Massachusetts and Connecticut are members of the New England Interstate Water Pollution Control Commission. In 1955, under the auspices of the Commission, the two States designated the condition of the entire reach of the river, with the exception of a few miles above Hartford, as Class D. The Commission defines the quality of Class D waters as "suitable for transportation of sewage and industrial wastes without nuisance, and for power, navigation and certain industrial uses." At the same time the States proposed and the Commission adopted the future highest use classification of the river from Holyoke to below Hartford as Class C. Class C waters are defined as suitable for recreational boating, irrigation of crops not eaten without cooking, habitat for common food and game fishes and industrial cooling and processing.

At that time five of 16 towns in Massachusetts provided sewage treatment. Since then three additional towns have placed treatment facilities in operation. Eight jurisdictions still discharge untreated sewage, but one has a treatment plant under construction, and two are arranging to convey the sewage to neighboring treatment plants. Only limited progress has been made in treatment of industrial wastes.

A study by the Public Health Service in October 1963 provided information on the present condition of the Connecticut River.

At no point on the river did the bacterial quality of the water meet the objectives most commonly used by water pollution control agencies. At the State line the total coliform bacteria density was 63 times a commonly used objective for general recreation, and 315 times the Connecticut standard for swimming. A few miles above Hartford the bacterial density was eight times the recreational objective and 41 times the swimming standard. Below the Hartford area the density rose again, to 32 and 160 times the desirable limits. These bacterial densities, derived from sewage, indicate that health hazards are involved in use of the water for recreation.

Suspended solids from sewage and industrial wastes produced sludge deposits throughout the impoundment from a short distance below Holyoke Dam to Enfield Dam in Connecticut. Paper fibers were found in all sludge collected. The sludge, covering the river bottom, interferes with fish spawning and the development of insect larvae and other aquatic life which serve as food for fish. As a result desirable sport fish do not exist in these areas, and only carp and bullheads prosper in the Enfield impoundment. Bottom organisms suitable for sport fish food were virtually nonexistent. The decomposing sludge contributes to the oxygen demand imposed on the stream and to depletion of dissolved oxygen in the water. In addition, gases of decomposition cause clumps and rafts of sludge to boil to the surface, where they are esthetically offensive. When sampled during the study the sludge gave off a hydrogen sulfide, or a typically rotten egg odor.

The oxygen demand exerted by the sewage and industrial wastes in the process of decomposition intermittently causes depletion of dissolved oxygen below the desirable level. Five mg/l of dissolved oxygen generally is accepted as the minimum necessary for propagation of a well balanced fish population and the bottom organisms on which they feed. This minimum is one requirement of the Commission standards for Class C waters. The dissolved oxygen of water at the State line averaged 5.8 mg/l during the sampling period, but was below the standard on three of the ten sampling days, and averaged less than 5 mg/l for the second week of the study. Data from other sources show that this was not an isolated occurrence.

Visual evidences of pollution which diminish the beauty of the water and are offensive esthetically included: cloudy and greyish appearance of the water in the vicinity of sewage and industrial waste discharges; intermittent colors of dyes from industrial wastes; small grease balls, bits of human excreta and condoms in the vicinity of sewage discharges; intermittent oil films on the surface of the river; and combinations of algae, oil and other floating materials which caused a green scum at the water lines of boats moored on the river.

It is obvious that sewage and industrial wastes discharged to the Connecticut, Chicopee and Westfield Rivers in Massachusetts cause pollution of the Connecticut River which endangers the health and welfare of persons in Connecticut and therefore, is subject to abatement under the provisions of the Federal Water Pollution Control Act.

APPENDIX

TABLE I-A - SAMPLING STATIONS

" II-A - SUMMARY OF FIELD DATA

" III-A - MEAN NUMBER BOTTOM ANIMALS

PER SQUARE FOOT-

CONNECTICUT RIVER, OCTOBER, 1963

" III-A - Continued - CONNECTICUT RIVER
TRIBUTARIES, October, 1963

CONNECTICUT RIVER
MASSACHUSETTS-CONNECTICUT

TABLE I-A

Sampling Stations

<u>RIVER MILE</u>	<u>DESCRIPTION</u>
C -97.3	State Hwy. 9 Bridge above Northampton, Massachusetts.
C -86.0	State Hwy. 202 Bridge above Holyoke, Massachusetts.
C -82.3	Just upstream from Padarewski Pumping Station, above mouth of Chicopee River.
C -76.8	Boston and Maine Railroad Bridge, above Springfield, Massachusetts, Bondi Island Sewage Treatment Plant and Westfield River.
C -70.7	Massachusetts-Connecticut State Line.
C -68.0	Just above Enfield Dam.
C -63.8	State Hwy. 140 Bridge at Windsor Locks, Connecticut.
C -55.2	State Hwy. 291 Bridge (Bissell Bridge) at Wilson, Connecticut.
C -40.3	South Glastonbury-Rocky Hill Ferry, State Hwy. 160, below Hartford, Connecticut.
Ch-11.3	Cottage Street Bridge, just north of U.S. Hwy. 20 at North Wilbraham, Massachusetts.
Ch- 4.7	Just off State Hwy. 141, under access to U.S. Interstate Hwy. 90.
Ch- 0.0	Mouth of Chicopee River.
W -11.4	State Hwy. 10 at Westfield, Massachusetts, above Westfield severs.
W - 7.8	Just off U.S. Hwy. 20 at U.S.G.S. Gaging Station.
W - 0.0	Mouth of Westfield River.
F - 1.2	U.S. Hwy. 5-A at Windsor, Connecticut.
C - Connecticut River	
Ch - Chicopee River	
W - Westfield River	
F - Farmington River	

CONNECTICUT RIVER
MASSACHUSETTS-CONNECTICUT

TABLE II-A

Summary of Field Data

Station River Mile	Dates 1963	Temp. ° C.	Coliform Bacteria		Dissolved Oxygen mg/l	5-Day BOD mg/l	Suspended Solids-mg/l		pH	Dis- charge cfs
			Total	MPN per 100 ml Fecal			Total	Volatile		
C -97.3	9/30-10/11*	14.9	31,400	6,320	8.80	1.79	7.0	3.1	7.3	
C -86.0	"	15.6	22,800	3,220	8.86	2.14	10.3	4.1	7.4	
C -82.3	"	16.6	307,000	27,800	7.85	6.53	20.7	10.8	7.2	
C -76.8	"	16.6	408,000	35,900	6.85	3.92	15.1	8.3	7.1	
C -70.7	"	16.6	315,000	38,900	5.76	3.77	14.6	7.3	7.1	
C -70.7	10/7-10/11	16.8	270,000	12,800	4.88	3.92	13.3	7.6	7.1	
C -68.0	9/30-10/11	16.7	105,000	19,800	5.74	3.65	13.7	7.0	7.2	3,460
C -63.8	"	16.1	62,500	5,950	8.71	3.38	13.2	6.3	7.4	
C -55.2	"	15.6	41,000	2,600	8.03	3.40	16.1	6.9	7.3	
C -40.3	"	16.8	162,000	50,100	7.24	4.15	20.0	8.3	7.2	
Ch-11.3	"	15.1	12,900	860	9.20	1.62	6.5	4.0	6.6	
Ch- 4.7	"	15.5	141,000	26,000	6.46	11.5	18.9	13.8	6.7	273
Ch- 0.0	"	15.4	947,000	116,000	4.65	6.86	17.3	10.5	6.8	
W -11.4	"	14.5	12,300	1,600	8.98	2.41	12.8	4.6	7.3	
W - 7.8	"	14.9	311,500	36,200	5.62	4.44	12.3	6.2	7.0	301
W - 0.0	"	15.7	142,500	10,000	6.02	3.48	16.0	4.9	7.1	
F - 1.2	"	14.3	6,900	2,300	9.06	1.80	15.4	3.5	7.2	484

* Exclusive of 10/5 and 10/6.

CONNECTICUT RIVER
MASSACHUSETTS-CONNECTICUT

TABLE III-4

Mean Number Bottom Animals Per Square Foot
Connecticut River, October, 1963

Station Location	River Mile	Sludge-worms	Midges	Leeches	Limpets	Snails	Planaria	Fingernail Clans	Caddis-flies	Clams
Control North Hampton	97.3	8	36	-	-	-	-	-	-	-
Exolds Marine Below Bolyoke	83.0	3	-	-	-	-	-	-	-	-
Mass. Turnpike Bridge Chicopee River Enters	82.1 80.4	42	8	-	-	-	-	-	-	-
Roy 20A Bridge	77.4	730	-	-	-	-	-	-	-	-
Westfield River Enters Below Hwy 5 (South) Bridge	75.0 74.8	804	4	-	6	-	-	-	-	-
State Line	70.7	994	8	-	-	-	-	-	-	-
Enfield	68.4	1143	18	-	6	128	22	-	-	1
Below Enfield Dam	67.9	48	396	-	-	264	336	96	456	-
1 Mile Above Farmington R.	58.1	-	1034	-	4	-	-	-	61	1
Bissell Bridge	55.2	42	63	-	-	-	1	-	8	1
South Glastonbury	41.0	211	163	12	-	-	3	-	-	1

CONNECTICUT RIVER
MASSACHUSETTS-CONNECTICUT

TABLE III-A

Mean Number Bottom Animals Per Square Foot
Connecticut River Tributaries, October, 1963
(Continued)

Location	River Mile	Sludge- worms	Midges	Leeches	Limpets	Caddis- flies	Stone- flies	May- flies	Snipe Flies	Misc.
<u>CHICOPEE RIVER</u>										
Cottage St. Bridge North Wilbraham	11.3	-	-	4	-	400	4	-	-	4
West St. Bridge Springfield-Ludlow Mid-stream Sample	7.3	-	8	16	-	600	-	-	-	8
Mass. Turnpike Access Bridge	4.7	28	-	-	-	-	-	-	-	-
River Mouth	0.1	1408	448	-	-	-	-	-	-	-
<u>WESTFIELD RIVER</u>										
Near Russell	20.0	-	80	-	4	480	1	4	4	25
Upstream from Westfield	12.0	6	240	-	32	1984	1	80	48	1
Below Westfield	7.8	17	6	-	-	-	-	-	-	1
River Mouth	0.1	574	-	-	-	-	-	-	-	-

MR. STEIN: Thank you, Mr. Kittrell.

Are there any questions or comments? Mr. Rogers?

MR. ROGERS: I have a question about the waste load figures.

In the waste load figures for the Monsanto Chemical Company, are these correct now in your table?

MR. KITTRELL: Since that time we have additional information on these sources of waste, which do change that picture slightly.

MR. STEIN: Are there any other comments or questions?

(No response.)

MR. STEIN: If not, thank you very much, Mr. Kittrell, for a comprehensive report, indeed. You should be commended. This is as fair and as complete a report as I have seen. It is very well done.

Mr. Rogers, do you have any other Federal representatives who want to make statements?

MR. ROGERS: I have one letter that I would like to read for the record of the conference. It is a paragraph out of a letter dated November 20, 1963, from Headquarters of the Commandant, Third Naval District, New York City.

"The Commandant, Third Naval District, wishes to reiterate his desire and intent to cooperate fully with the Public Health Service in the control of pollution of rivers and their tributaries by naval activities located in the Third Naval District. Since the Third Naval District includes only the New England State of Connecticut, his interest in this matter must be limited to that part of the Connecticut River and its tributaries lying within that State. The Commandant, First Naval District, is concerned with these matters insofar as the other New England states are involved, as you are no doubt aware. It is assumed that you have addressed a similar letter to him.

"There are four naval installations located on lands in Connecticut which are in the drainage basin of the Connecticut River. These are: Kaman Aircraft Corporation (Naval Weapons Industrial Plant), Old Windsor Road, Bloomfield; U. S. Naval Nuclear Power Training Unit, Prospect Hill Road, Windsor; U. S. Naval and Marine Corps Reserve Training Center, Reserve Road, Hartford; and U. S. Naval Reserve Training Center, River Road, Cromwell. At the first and last installations, sewage is treated in septic tanks with subsurface effluent disposal. The second activity occupies private property, and the third is connected to the Hartford municipal sewerage system. It is considered that the Navy has cooperated to the fullest extent possible in the control of pollutions of the Connecticut River and its tributaries as far as the Third Naval District is concerned."

We do have a letter from the First Naval District, in which there are no installations involved from this district.

We have representatives of several of the other Federal agencies, but I don't believe any of them care to make statements.

MR. STEIN: Mr. Rogers, I think it might be best, if there is no objection, that that whole letter go into the file, rather than the paragraphs you read, so that it can be seen in context.

Is that agreeable?

MR. ROGERS: Fine. Shall I read the entire letter now?

MR. STEIN: We will accept it as read for the record.

MR. ROGERS: All right.

(The letter referred to is as follows:

"Headquarters of the

COMMANDANT THIRD NAVAL DISTRICT

Federal Office Building, 90 Church Street

New York 7, N. Y.

5050/6240

RWS: jbr
64A (DPMO 3ND)
Ser 245025

20 NOV 1963

"Mr. Herbert H. Rogers, Regional Program Director
Water Supply and Pollution Control
U. S. Public Health Service, Region I
120 Boylston Street
Boston, Massachusetts 02116

"Dear Sir:

"This is in reply to your letter of 30 October 1963 announcing the two conferences in the matter of pollution of: (1) the Connecticut River and its tributaries (Massachusetts - Connecticut); and (2) the interstate waters of the Merrimack River, the Nashua River and their tributaries (Massachusetts - New Hampshire) and the intrastate portions of these rivers within the State of Massachusetts.

"The Commandant, Third Naval District, wishes to reiterate his desire and intent to cooperate fully with the Public Health Service in the control of pollution of rivers and their tributaries by naval activities located in the Third Naval District. Since the Third Naval District includes only the New England State of Connecticut, his interest in this matter must be limited to that part of the Connecticut River and its tributaries lying within that state. The Commandant, First Naval District, is concerned with these matters insofar as the other New England states are involved, as you are no doubt aware. It is assumed that you have addressed a similar letter to him.

"There are four naval installations located on lands in Connecticut which are in the drainage basin of the Connecticut River. These are: Kaman Aircraft Corporation (Naval Weapons Industrial Plant), Old Windsor Road, Bloomfield; U. S. Naval Nuclear Power Training Unit, Prospect Hill Road, Windsor; U. S. Naval and Marine Corps Reserve Training Center, Reserve Road, Hartford; and U. S. Naval Reserve Training Center, River Road, Cromwell. At the first and last installations, sewage is treated in septic tanks with subsurface effluent disposal. The second activity occupies private property, and the third is connected to the Hartford municipal sewerage system. It is considered that the Navy has cooperated to the fullest extent possible in the control of pollutions of the Connecticut River and its tributaries as far as the Third Naval District is concerned.

"The Commandant, Third Naval District, appreciates your courtesy in extending him the invitation to be represented at these conferences. However, inasmuch as Third Naval District is, at most, marginally involved and could not contribute in any measurable way to their proceedings, the district will not participate.

"Yours very truly

A. L. BECKER

Chief of Staff

"Copy to: (w/cy PHS ltr of 30 Oct 1963)

COMONE
BUDICKS (Code 63.302C)
DPWO 3ND")

* * *

MR. ROGERS: We have representatives from some of the other Federal agencies, but they have not indicated they wish to make any statement, unless the Fish and Wildlife representative wants to make a statement.

MR. NELSON: I am from the Fish and Wildlife Service.

MR. STEIN: Would you identify yourself for the record?

MR. NELSON: Carl F. Nelson. I have no statement at this time.

MR. ROGERS: All right, fine.

I don't believe there is any statement from the Corps of Engineers.

Mr. Tracy, you have none to make?

MR. TRACY: No statement at this time.

MR. ROGERS: All right, fine. Those are the only Federal agencies.

MR. STEIN: Thank you.

I think we should call your attention to the fact, among other things, that the 1961 amendments to the Federal Act provided that Federal installations were to be included in conferences of this type, and we do have an active program underway for abatement of pollution from Federal installations.

I was up here just several weeks ago when the House Committee on Government Operations held a hearing in Hartford. At that time the State indicated that there weren't really any serious problems of pollution from Federal installations, particularly in the area we are considering today.

However, our report does say -- and I am just flagging this and I wouldn't like the record to stay this way unless we clear it up at some point before we finish -- that the Westover Air Force Base sewage is reported to be septic at the point of discharge into the Chicopee River and to cause a local odor nuisance.

Before we finish the conference, I hope that will be cleared up.

If there is no further comment, does that conclude the Federal presentation?

MR. ROGERS: I think that will be covered in Mr. Taylor's statement.

MR. STEIN: Thank you.

At this point we will take a recess for about ten minutes, and we will promptly reconvene. Thank you.

(Whereupon a recess was had.)

MR. STEIN: At this point we would like to call on the representative of the New England Interstate Commission, Mr. Joseph Knox.

Mr. Knox.

STATEMENT OF
JOSEPH C. KNOX, SECRETARY
NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION

MR. KNOX: Mr. Chairman and members of the conference;

At this time I would like to take the opportunity of introducing Mr. George L. Burke of Hartford, Connecticut, who is the current Chairman of the New England Interstate Water Pollution Control Commission.

Chairman Burke has directed me to present the following statement on behalf of the New England Interstate Water Pollution Control Commission:

For many years the New England area has been involved in water pollution control problems because of concentrated populations and extensive waste-producing industries. With the public demands for clean waters, the States enacted effective water pollution control laws to meet the situation. However, as the States endeavored to carry out their respective pollution control programs, it became more and more apparent that in an area which is virtually a network of rivers crossing and recrossing State lines and in some instances forming the boundary between States, a coordinated interstate program was essential to a sound and equitable solution to the problem. Thus, in 1947 the New England Interstate Water Pollution Control Compact was drafted by the States, approved by Congress and ratified by the legislatures of Connecticut, Massachusetts and Rhode Island. Subsequently the other eligible States of Maine, New Hampshire, New York and Vermont became signatories to the Compact.

The NEIWPC Compact is the legal instrument for cooperation between the States and provides the machinery for resolving interstate water pollution problems in the area. The Compact is administered by the New England Interstate Water Pollution Control Commission, which is composed of five members from each signatory State. An important part of the Commission organization is its Technical Advisory Board, composed of the directors of the State water pollution control agencies. The Board carries out the technical phases of the program and prepares recommendations for Commission consideration and action.

Recognizing the necessity of a balanced use of the area's waters to meet the various degrees of water quality required for the proper maintenance of the social and economic well-being of the region, the Compact sets up a procedure for classifying interstate waters according to highest use. This classification system is based on accepted water quality standards, and reconciles the conflict of water uses by the assignment of use classifications which will best serve all interests concerned.

Under the terms of the Compact, each signatory State agrees to prepare classifications of its interstate waters according to present condition and proposed highest use and to submit them to the Commission for approval. After approval by the Commission, the States involved are pledged under the terms of the Compact to establish programs of treatment of sewage and industrial wastes to bring about the improvements required to meet the approved classification. The Commission has no authority to issue orders for pollution abatement. Such powers are retained by the individual States and used when needed to enforce classification requirements.

To coordinate and facilitate the preparation of proposed interstate water classifications by the States, subcommittees of the Technical Advisory Board have been established by the Commission for each of the interstate river basins and tidal areas. Each subcommittee is composed of the Board members from the States included

in the basin or area. Coordinated sampling programs and sanitary and industrial waste surveys are arranged by each subcommittee to procure the necessary data for classification preparation. The proposed classifications are discussed at public and group meetings before being submitted to the Commission for approval.

The Commission is represented here today pursuant to a notice under date of September 23, 1963, from Anthony J. Celebrezze, Secretary of Health, Education, and Welfare, calling a conference in the matter of pollution of the Connecticut River on the basis that he has reason to believe pollution occurring in Massachusetts is endangering the health and welfare of persons in Connecticut. We are advised that for the purposes of this conference only that section of the Connecticut River from Hatfield in Massachusetts to twelve miles below Hartford in Connecticut, together with the lower reaches of two Connecticut tributaries, the Chicopee and Westfield Rivers, is to be considered. The calling of such a conference is the first step in the enforcement procedure by the Federal Government under the provisions of the Federal Water Pollution Control Act (Public Law 660). Under this Act the primary responsibilities and rights in preventing and controlling water pollution are vested in the States. Federal enforcement action shall not displace State action to abate pollution unless the States fail to plan and execute an effective pollution abatement program.

What is the Connecticut River pollution control program as planned and executed by Massachusetts and Connecticut?

In accordance with its established procedure the Commission upon request of Massachusetts and Connecticut established in 1954 a Technical Advisory Board subcommittee on classification of the Connecticut River. Coordinated sampling programs and surveys were conducted and proposed classifications prepared by the subcommittee. A public meeting for a presentation of the proposed classifications was held in Springfield, Massachusetts, on March 23, 1955. Included in the attendance of 67 persons were municipal officials and representatives of industries, sportsmen organizations and watershed associations.

Following the public meeting the Commission officially approved the proposed classifications in conformity with its authorized powers. The waters of the Connecticut River above the Holyoke Dam and below Middletown were classified as Class B. This high quality water is suitable for bathing and recreation, irrigation and agricultural uses; good fish habitat; good esthetic value; acceptable for public water supply with filtration and disinfection.

The Connecticut River between Holyoke and Middletown is lined with many densely populated communities and the waters in this section were placed in a Class C category. Class C waters are suitable for recreational boating, irrigation of crops not used for consumption without cooking; habitat for wildlife and common food and game fishes indigenous to the region; industrial cooling and most industrial process uses.

The objective of the States is to assign the highest possible use classification which will be most beneficial to the public in general and at the same time is practical and can be attained under the circumstances. Class C was the highest classification that could be proposed for the waters below the Holyoke Dam because of the physical unsuitability of the shores for bathing beach development and the esthetical unacceptability of the area for bathing because of the presence of the many sewage treatment plant outfalls, but principally because of the lack of an economic solution to the problem of discharges from overflows on combined sewerage systems. Bathing in waters receiving such discharges is prohibitive under all sanitary standards.

The Class C classification does not contain a bacterial water quality standard. It is impossible to maintain such a numerical figure when combined system overflows

exist as in the area under consideration. Instead of a standard, the States have adopted a policy of chlorination of all sewage treatment plant effluents. This is part of the policy that there shall be no discharges of untreated sewage into any waters. There would be no point in requiring chlorination at the treatment plants in the Class C section of the Connecticut River until treatment plants in the large cities of Holyoke, Chicopee and Westfield are constructed.

Upon the adoption of this classification as the present goal for pollution control in the Connecticut River, the pollution control agencies of the two States initiated pollution abatement programs for compliance with the water quality standards.

What then is the status of pollution abatement in attaining the classification adopted for the portion of the Connecticut River under discussion?

The generally accepted parameter for evaluating pollution abatement is the percent of the sewered population served by sewage treatment plants. As shown in the following table, 90 percent of the sewered population is being served by treatment plants or such plants are under construction. Construction plans have been approved for seven percent of the sewered population and preliminary plans have been approved or are in preparation for the remaining three percent. Positive action to conform with classifications and time schedules has been taken in all instances.

Status of Municipal Sewage Treatment
(Connecticut River from Hatfield to below Hartford)

	<u>Percent of Sewered Population</u>		
	<u>Massachusetts</u>	<u>Connecticut</u>	<u>Total</u>
In Operation or Under Construction	84.0 (12)	99.6 (4)	90.0 (16)
Final Plans Approved	12.0 (1)	----	7.0 (1)
Preliminary Reports Approved or in Preparation	4.0 (4)	4.0 (4)	3.0 (5)

Note: (16) indicates number of communities.

The pollution control situation in that section of the Connecticut River Valley involved in this conference may be summarized as follows:

1. Comprehensive studies have been completed by the State water pollution control agencies.
2. Classifications for highest possible use under present circumstances have been adopted.
3. Effective pollution abatement to meet the classifications is nearly completed.
4. Communities and industries have cooperated in the abatement programs and Federal enforcement action is entirely unnecessary.

MR. STEIN: Thank you.

Are there any questions or comments?

(No response.)

MR. STEIN: If not, at this point we would like to call on Mr. Wise, who has a representative from Connecticut who has a statement to make.

MR. WISE: Mr. Frank, a member of the Connecticut State Board of Fisheries and Game has a commitment in Bridgeport in the early afternoon, and he would request an opportunity to make a statement at this time.

MR. STEIN: Thank you.

STATEMENT OF
RUDY FRANK, CHAIRMAN
CONNECTICUT BOARD OF FISHERIES AND GAME

MR. FRANK: Thank you, Mr. Wise.

The Connecticut Board of Fisheries and Game is for cleaner waters in our State, and is, without reservation, in favor of all constructive efforts which may accomplish this result. We are firmly supported in this stand by the more than 130,000 licensed sportsmen, and by a larger number of citizens and organizations interested in conservation who have written to us or who have talked to our Board about the pollution problem.

The programs for developing and improving outdoor recreation in our country which were advocated by our late President John F. Kennedy, together with our own Open Space Program as devised by Governor John Dempsey, point up the growing need for many more areas which can be used by the people for outdoor recreational activities. Most of these have a basis of water as the root of enjoyment. It is foolish for us--especially--in so small a State as Connecticut to continue to befoul our precious small store of water resources.

Without question, there is considerable pollution in the Connecticut River. Whether the blame lies within Connecticut or Massachusetts is a moot point. I believe there is culpability on both sides. Manufacturing plants, towns and cities alike contribute to the undesirable condition which prevails. I daresay that everything has been dumped into the Connecticut River and that includes raw sewage, garbage, factory waste and even the unwanted debris and refuse of the individual citizens.

The particular interest of the Board of Fisheries and Game is to foster, develop and protect good fishing and good hunting, as well as the best possible biological climate in which fish and wildlife may prosper. Our outlook is not, however, shortsighted. We realize that fishing is very often undertaken in conjunction with other family activities such as swimming, boating and picnicking. We therefore support any proposal which is designed to improve the qualities of our waters to the highest level compatible with the recreational benefits to be derived.

The Connecticut River, being the largest body of water in our State, has an enormous potential for water-based activities. An unpolluted Connecticut River has provided many varieties of fish life. To name some of the species, the list would include: northern pike, shad, catfish, salmon, alewives, white perch, striped bass, yellow perch, large-mouth bass and bullheads. The fish mentioned are in the river now (except for the shad, which each spring come up the river to spawn) in relatively small numbers. Speaking of shad, evidence shows that they lose a great deal of their flavor from the time they enter the river at Saybrook until they are caught upstream at Enfield.

Speaking for the Board of Fisheries and Game, I would like to point out for the record that the Connecticut Water Resources Commission has made a fine record of accomplishment, especially during the past fifteen years. They have done much to educate manufacturing concerns and communities alike in the matter of installation and proper usage of pollution abatement equipment. Their work has also been evident in cooperating with the States to the north of us who border on the river in accelerating pollution control.

Notwithstanding our awareness of the work that has been done, we cannot be worthy of our responsibilities to the people of Connecticut if we did not express a

fervent hope that this committee, through this and other similar hearings, causes the Federal Government to impress its power to help alleviate the pollution problems of the Connecticut River. We are hopeful that a favorable decision which leads to Federal assistance in the areas mentioned will be forthcoming soon.

Thank you, Mr. Chairman.

MR. STEIN: Are there any questions or comments?

Mr. Frank, I think Mr. Rogers may have a question for you.

MR. FRANK: Yes, sir.

MR. ROGERS: Mr. Frank, do you have some specific plans for storing fish in there once it is cleaned up?

MR. FRANK: Sure. We are constantly looking for clean water to stock new species. If the water is clean and it can support other fish life, we certainly will utilize the stream for any species it can support.

MR. STEIN: I know you have a representative here from Fish and Wildlife. Perhaps I should not speak of this, but I do know that at least nationally the Fish and Wildlife Service are very interested in these New England streams, particularly where there used to be reports of fish years ago -- that is, fish that go out to the sea and come up to spawn. They have indicated many, many times that if we can produce a relatively clean stream up here, they would do all in their power to see what can be done to restore the runs of the fish.

I know this is a program that has a really high priority with the Federal Fish and Wildlife Service. They are just anxious for an opportunity, they tell me, to try to get a demonstration to see what can be done.

MR. FRANK: Well, Mr. Chairman, we are cognizant of this fact, and we cooperate very closely with the Fish and Wildlife Association,

MR. STEIN: Thank you, Mr. Frank.

MR. FRANK: Thank you very much.

MR. STEIN: Now I think we can continue in the relatively normal course of events.

You don't have anyone else, Mr. Knox?

MR. KNOX: No.

MR. STEIN: If not, we will call on Mr. Worthen H. Taylor from Massachusetts at this time.

Mr. Taylor.

STATEMENT OF
WORTHEN H. TAYLOR, CONFEREE
FOR THE DEPARTMENT OF PUBLIC HEALTH
COMMONWEALTH OF MASSACHUSETTS

MR. TAYLOR: Mr. Chairman and members of the conference:

Under the date of September 23, 1963, the Secretary of Health, Education, and Welfare, Anthony J. Celebrezze, called a conference on the matter of pollution of the Connecticut River and its tributaries (Massachusetts-Connecticut) to be held on December 2, 1963, at 9:30 a.m. EST, at the Federal Court Room, U.S. Post Office Building, 135 High Street, Hartford, Connecticut. This conference is held under the provisions of the Federal Water Pollution Control Act (33 U.S.C. 466 et. seq.), otherwise known as Public Law 660, 8th Congress, as amended. Participation is limited to representatives of the United States Department of Health, Education, and Welfare, Massachusetts Department of Public Health, the Connecticut Water Resources Commission, and the New England Interstate Water Pollution Control Commission. I have been designated to represent the Massachusetts Department of Public Health at this conference.

A description of the Connecticut River, pertinent data relative to the pollution of the river and the status of the pollution abatement program with particular reference to the watershed from Hatfield to the Massachusetts-Connecticut boundary line and portions of the stream within the State of Connecticut, are described in the report of the United States Public Health Service titled, "Report on Pollution of Interstate Waters of The Connecticut River, Massachusetts-Connecticut," and dated October 26, 1963. The Massachusetts Department of Public Health has contributed to the collection and assembly of data for this report and the material presented for that portion of the stream within the Commonwealth of Massachusetts is factual to the best of our knowledge.

Massachusetts is densely populated and highly industrialized. The economy of the area was originally built on textile and paper industries. The mills were located on our streams to take advantage of direct water power, large volumes of soft, clear water, and a ready means of disposal of liquid wastes. Water supply for public purposes was obtained from the headwaters of many of the streams. Such supplies were protected through the acquisition of watershed lands to prevent access which might result in pollution. Sanitary sewage and industrial wastes were discharged through many outlets below the sources of potable water supply. To this date it has been necessary to obtain public water supplies from waters receiving direct pollution only within the watershed of the Merrimack River. No sources of public water supply are taken from the Connecticut River or its tributaries below known sources of pollution.

The first comprehensive water pollution control in the Commonwealth was contained in Chapter 615 of the Acts of 1945. This gave to the Department of Public Health a directive to provide rules and regulations for the prevention of pollution and contamination of all of the waters of the Commonwealth. Such rules and regulations adopted are four in number and continue in effect. Paraphrased these rules and regulations provide that:

(1) No sewage shall be discharged to any of the waters of the Commonwealth without first obtaining the approval of the Department of Public Health.

(2) No garbage, or manure, or other putrescible matter shall be discharged to the waters of the Commonwealth without first obtaining the approval of the Department of Public Health.

(3) No industrial wastes shall be discharged to the waters of the Commonwealth without first obtaining the approval of the Department of Public Health.

And just to make sure that nothing was forgotten,

(4) No substances whatsoever shall be discharged to any of the waters of the Commonwealth without first obtaining the approval of the Department of Public Health.

A copy of such rules and regulations is included as Appendix I.

Previous to that time the Merrimack and Connecticut Rivers had been specifically excluded from regulation of pollution by the Department as these two streams were considered industrial streams. By 1945 the Connecticut River was receiving large volumes of untreated sewage and industrial wastes. Sewage treatment facilities had been constructed and were in operation as follows: Amherst, Belchertown, Greenfield, Winchendon, Springfield (2), East Longmeadow, Gardner, Ludlow, Spencer and Easthampton.

You may note that I have included the entire river valley rather than simply the area that has been reported upon by the United States Public Health Service and the Department of Health, Education, and Welfare.

Subsequently, sewage treatment facilities have been provided by the following municipalities: Longmeadow, Northampton, Russell, North Brookfield, Deerfield (2), Sunderland, South Hadley.

Treatment facilities are currently under construction in Holyoke, Hadley and Montague. Bids for construction of the treatment plants of Warren and Ware have been advertised. An interceptor has been constructed and now conveys sewage of that portion of the Agawan tributary to the Westfield River to the Bondi Island treatment works of the City of Springfield. The Connecticut River interceptor of the town of Agawan is nearing completion and will discharge to the Bondi Island treatment plant.

The town of West Springfield is constructing interceptors which will shortly discharge to the Bondi Island works of Springfield.

Plans have been approved for the construction of a treatment plant and the first phase of the Chicopee River interceptor to serve the City of Chicopee. Funds for such construction are not available at the present writing; however, an application for an Accelerated Public Works grant has been presented, approved and submitted to the Public Health Service.

The City of Westfield has plans, approved by the Department of Public Health, for the construction of sewage treatment facilities. As a construction program has not been implemented, this matter has been referred to the Attorney General with a request that he take such steps as may be necessary to cause the City of Westfield to abate the pollution of the Westfield River.

Engineering studies and reports have been completed for the following municipalities: Hatfield, Brookfield, East Brookfield, Buckland, Shelburne, East Greenfield, and Athol. Engineering studies are underway relative to providing treatment facilities to serve the following municipalities: Northfield, Palmer and Hardwick.

Massachusetts is signatory to the New England Interstate Water Pollution Control Compact as it is described in the statement of Mr. Joseph C. Knox, Executive Secretary of the Compact Commission. The main stem of the Connecticut River in Massachusetts was classified on March 24, 1955, as shown in Appendix II.

The uppermost reaches of the Connecticut River were not classified at that time as classification of the waters of the State of New Hampshire is a prerogative of the legislature of that State and no action had been taken relative to this matter. Tributaries of the Connecticut River in Massachusetts have been classified as follows:

Deerfield - See Appendix III
Millers - See Appendix IV
Chicopee - See Appendix V
Westfield - See Appendix VI

The classifications adopted have taken into consideration the present and future uses of the waters of the various streams. There is currently no indication that the waters of the Connecticut River or its tributaries will be further used for public water supply purposes, with the exception of the waters of the middle branch of the Westfield River.

The City of Springfield has agreed with the United States Army, Corps of Engineers, relative to a water supply pool within the flood control reservoir under construction at Middleville in the Town of Chester. It is currently anticipated that these waters will be used for water supply purposes approximately twenty years hence.

Massachusetts has adopted a policy of providing such sewage and industrial wastes facilities as may be necessary to maintain our streams within their future highest use classification. The Department of Public Health is of the opinion that the Connecticut River above the Holyoke Dam would be used for bathing, water skiing and other recreational purposes and thus it was placed in a "B" classification. Sewage treatment plants in this area provide for chlorination of the effluents during the bathing season.

Below the Holyoke Dam the cities of Holyoke, Chicopee and Springfield have sewerage systems constructed on the combined plans. During periods of heavy rainfall combined sewers discharge wastes in excess of interceptor capacity to the adjacent waters. The cost of separation of sewage and storm water is too great to be practical. The Connecticut River and its tributaries in this vicinity are not suitable physically for bathing and in most instances unsuitable for boating. The Department is of the opinion that there will not develop any major boating activity in the area. The channel is shallow, narrow and short. The distance to suitable bathing and boating areas is relatively short and quickly available. It would appear more desirable to construct bathing pools to serve the area than to provide waters of suitable quality for that purpose in the Connecticut River.

The standards of water quality for the various classifications within the New England Interstate Water Pollution Control Compact area do not specify whether they refer to absolute minimums, average minimums over a given period of time, or other minimum or averages at specific flows or other parameters. In Massachusetts the seven consecutive days of minimum flow is most frequently a basis of design for application of the minimum numerical standard.

The sampling of the Connecticut River and its tributaries was conducted by the Department of Health, Education, and Welfare with the cooperation of the Massachusetts Department of Public Health during an excessively dry period, September 30 through October 11, 1963. The results of the analyses of these samples showed dissolved oxygen slightly below 5 parts per million in a limited number of instances. Considering the low flow of the river at that time this is not surprising but does indicate that the dissolved oxygen content of the river, upon completion of the sewage treatment plants now under construction and those proposed, will be far in excess of 5 parts per million at all times.

The number of coliform bacteria in the waters during this period was in excess of bathing water standards. The Department of Public Health has assumed that chlorinating facilities will be provided for all of the sewage treatment plants in the Connecticut River Valley during the recreational season. Plants which normally chlorinate were not doing so during the sampling period. The Department of Public Health has not insisted upon chlorination of plant effluents at this time, realizing that certain communities were discharging raw sewage to the river. The Department will require the installation and operation of chlorinating facilities when all sewage is under treatment. Plants now being designed and constructed in the Connecticut River Valley will be equipped with chlorinating facilities.

The waters of the Connecticut River are highly colored, and, in fact, not entirely suitable for public bathing because of the physical hazards involved. No amount of treatment will alter this condition. However, the Department does anticipate that the waters above the Holyoke Dam will be suitable for such purposes provided special precautions are taken for the safety of bathers.

One of the major problems of pollution control in the Connecticut River is that of flow regulation. Hydroelectric plants along the river are used for peaking purposes. Waters are drawn down during the week and allowed to accumulate over weekends in many instances. Thus, at times, there may be only leakage through dams to provide dilution for the sewage and industrial wastes or treatment plant effluents. This is a matter which has been of concern at certain power reservoirs in other areas of the country, and special provisions have been made to permit the discharge of stated quantities of water continuously. There is no law relative to this matter in Massachusetts, industries being permitted almost without exception to utilize the entire flow of the river or to cut off the flow at will. In order to provide adequate flows for dilution purposes, it may be necessary for the Commonwealth to purchase water rights which it had previously allocated to industrial establishments. Consideration is being given to such legislation at this time, but it is not anticipated that there can be any law made effective in this area immediately.

The Department of Public Health would also like to make note of the fact that many industries have reduced their pollutional loads upon the receiving waters other than by means of construction of treatment facilities. In many instances industries have spent large sums to discharge wastes to public sewerage systems. Processing chemicals of high B.O.D. have been replaced by other materials of low B.O.D., for instance, the use of certain man-made sizings to replace starch. Other plants have provided for recirculation of the liquid wastes. The installation of save-alls and other devices have been installed for the reclaiming of fiber. In other instances, lagoons have been provided to discharge wastes at near constant rates during periods of high flow while retaining the same during periods of low flow. Incineration of certain wastes is anticipated as a substitute for treatment facilities of a more conventional nature.

The Department of Public Health has not generally required industries to abate pollution of industrial waste prior to the installation of municipal works for the treatment of domestic sewage. The time has come for these programs of sewage pollution abatement and industrial waste abatement to proceed simultaneously in the Connecticut River Valley. The following tables show sources of pollution and a time schedule for abatement which the Department proposes to require.

In conclusion, the Department is of the opinion that its sewage and industrial waste program is proceeding at a rate which will provide a water quality far in excess of minimum standards adopted for the various classified portions of the river. The remaining unclassified portions of the Chicopee River may be classified at the December meetings of the New England Interstate Water Pollution Control Commission. Commitments

have been received from many municipal and industrial polluters for the early inauguration of abatement programs. The Commonwealth of Massachusetts does not wish to refer cases of pollution to the courts, but will not hesitate to do so as demonstrated in the case of the City of Westfield.

The Department does not believe that pollution arising in Massachusetts even now is adversely affecting water uses within the State of Connecticut, but will continue to require the installation of sewage and industrial waste treatment facilities to eliminate all sources of untreated sewage, local nuisances, and unsatisfactory water conditions. This program will necessarily improve the quality of the waters in the Connecticut River as it crosses the State line. The Commonwealth is able and willing to conduct its pollution abatement program in the Connecticut River Valley without further direction from the Federal Government, but looks forward to a close cooperation with all Federal, State, and local efforts in this direction.

(The tables referred to are as follows:)

CONNECTICUT RIVER WATERSHED
Significant Sources of Sewage Discharge

CONNECTICUT RIVER									
Municipality Source	Sewered Population	Type of Sewerage System	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr.	Completed
Northfield Northfield Seminary	500	S	--	500	None		Town applied for HHFA planning loan		1965
Northfield Mt. Herman School	500	S	--	500	Lo				
Montague Turners Falls and Montague City	4985	C			SchGhOnEg VrZil		Under construction		1964
Greenfield Sewer outlets in East Greenfield					None		Sewer study completed		1965
Sunderland Municipal Treatment Plant	400	C	0.250	400	ScGhAnCKnc				
Amherst Municipal Treatment Plant	16,000	S	1.100	16,000	GancShOnEg IbrZilVr Bco	6840			
Deerfield So. Deerfield Treatment Plant	3340	C			ScEg				
Ratfield Sever	1300	C		1300	None		Study and Report by Consulting Engineers completed		1966

CONNECTICUT RIVER (cont.)								
Municipality Source	Sewered Population	Type of Sewerage System	Type of Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed
Hadley	0	No direct discharge			SchAmCnEg		Sewerage and Treatment Plant under Construction	
Northampton Municipal Treatment Plant	24,045	S	2.70		GhSchCnEg DfhrtrBo	18,400		
Easthampton Municipal Treatment Plant	11,095	S	1.250		GhSchCn Dcmrhtf BoEg	8,520		
Easthampton Sewer Outlets Mt. Tom Section	200	S		200	None		Study Completed	1966
South Hadley Municipal Treatment Plant	13,500	C	0.60		GmSchCnEg DchrtgBo			
Holyoke Sewer Outfalls	52,500	C	12.50		SaCmGrTcVv Zilla		APW project under construction	1965
Chicopee Sewer Outfalls	52,500	C			None		Construction plans approved. APW application submitted, pending availability of Federal funds	1966
Belchertown* Belchertown State School	2,100	S	0.280	2,100	CpPaE Bo		SaCmGrTcVv Zilla	

*Lampson Brook to Bachelor Brook to Connecticut River

CONNECTICUT RIVER (cont.)									
Municipality Source	Sewered Population	Type of Sewerage System	Average Daily Flow MOD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed	
Springfield Municipal Treatment Plant	187,000	C	19.6		GmScCdDfrrt msZiyVvXn				
West Springfield Outfall Sewers					None		Interceptors and P.S. under construction (will discharge to Springfield S.T.P.)		
East Longmeadow Municipal Treatment Plant	7,700	S	0.40		ShGhCiFtn CpKcgBo	1,330			
Longmeadow	9,500	S	0.82		GhSchCaEg Dc hmrTgBc	9,250			
Agawan Sewer	2,000	S			None		APW grant-interceptors and pumping stations under construction		
<u>OTTER AND MILLERS RIVERS</u>									
Winchendon Municipal Treatment Plant	3,150	S	0.253		ShCpFsaBo				
Templeton Sewer (Baldwinville) Outlets	300				None				
Gardner Municipal S.T.P.	13,000	S	1.760		ScCaFthCaFs DcarhtBo		(to Otter River)	1966	

OTHER AND MILLERS RIVERS (cont.)						
Municipality Source	Sewered Population	Type of Sewerage System	Average Daily Flow MGD	P.E. Before Treatment	P.E. Type of Treatment	Abatement Program Constr. Completed
Royalston	150	S		None	Advised town to engage engineers	1966
Athol	10,000	S		None	Study completed	1966
Orange	3,800	C		None		1966
Erving	650	S		None		1966
<u>DEERFIELD RIVER</u>						
Monroe					Application made for MIPA loan for planning	1966
Florida					Recommending local disposal	
Charlemont					Recommending local disposal	
Ashfield	100			None	Recommending local disposal	
Buckland	1,200	S		None	Study Completed	1966
Shelburne	1,050	C		None	Study Completed	1966
Deerfield	1,100			ScEg		
Greenfield	15,400		1.9	GH&C&Dchr 10,500 NoBo	Chlorination to be added	1965

WARE RIVER								
Municipality Source	Sewered Population	Type of Sewerage System	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed
Barre	1,000				None			
Hardwick (Gilbertville) Outlets	400	C			None		Town applied for MHYA loan	1966
Hardwick (Wheelwright) Outlets	100				None		Town applied for MHYA loan	1966
Ware	6,000	C					Opening bids for construction Dec. 1963	1965
<u>QUABOAG RIVER</u>								
Spencer	3,680	S	0.553		CaPaBo			
Spencer	220	S	0.015		ShPa			
North Brookfield	2,500	S	0.460		ShClFtnEgBo			
Brookfield					None		Study Completed	1966
Warren	550						Received APW Grant for Sewerage System and Treatment Facilities (OnSchAmCaBcg)	1965
							Bids received. Engineers retained.	
Palmer	2,000	C						1966

QUABOAG RIVER (cont.)						
Municipality Source	Sewered Population	Type of Sewerage System	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment
Monson	State Hospital S.T.P.	1,850	3	0.20	SeClFtrOpBo	
Monson						Study Completed 1966
Wilbraham		480	C		CHICOPPE RIVER	Study completed 1966 To Springfield Plant
Ludlow		4,400	3	0.95		
Chicopee	Westover Field S.T.P.		3	1.2	ShghOnCa Dc rt Bo	To tie to Chicopee 1966
Chicopee	Sewer Outlets	52,000	C		None	See Chicopee on Connecticut River
Springfield	Indian Orchard S.T.P.	16,000	C	1.36	GhSghCaDfrhBo	
Chester	Sewer Outlets					Study completed 1966
Huntington	Sewer Outlets				None	Study completed 1966
Russell	Mun. S.T.P.	800			SchAmCaEch	
Russell (Vermacco)	Sewer Outlets				None	1966

CONNECTICUT RIVER WATERSHED
Significant Sources of Industrial Waste Discharge

CONNECTICUT RIVER								
Location (Municipality)	Name of Facility	Type of Waste	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed
Montague	Ealeek Mfg. Co.	Paper			Save-alls- dilution in canal	1500	Presently adequate	
Montague	Strathmore Paper Co.	Paper			Save-alls- dilution in canal		Presently adequate	
So. Hadley	Taxon Inc.	Paper	430		None	430	Needs solids removal	1965
Holyoke	American Writing Paper Company	Paper			Save-alls		Needs additional solids removal	1965
Holyoke	Chemical Paper Mfg. Co.	Paper			None		Needs solids removal	1965
Holyoke	Franklin Paper Company	Paper			None		Needs solids removal	1965
Holyoke	Valley Paper Company	Paper			Save-alls		Needs additional solids removal	1965
Holyoke	Whiting Paper Company	Paper			None		Needs solids removal	1965
Chicopee	Springfield Rendering	Rendering			Flotation	5000	To Springfield	1968

OTTER AND MILLERS RIVERS

Location (Municipality)	Name of Facility	Type of Waste	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed
Templeton	Seaman Paper Company	Paper	1.0		Save-alls	8000	To provide study 1964	1965
Templeton	Erving Paper Company	Paper	3.0		Save-alls	28,500	To provide study 1964	1965
Athol	Athol Mfg. Co.	Synthetic textile	0.05	1500	None	1,500	To municipal sewerage system	1965
Erving	Erving Paper Mills	Paper	3.5	5200	None	5,200	Needs solids removal	1965
Erving	Millers Falls Paper Company	Paper	1.0		Save-alls	2,100	Needs further solids removal	1965
Erving	Millers Falls Company	Cutting oils plating	0.04	100	None	100	Needs plating waste treatment	1965

DEERFIELD RIVER

Monroe	Deerfield Glassine Co.	Paper			Flotation save-alls	2,200	Further solids removal	1965
Colrain	The Kendall Company	Cotton Textile					Secondary Treatment	1966

WARE RIVER

Barre	Barre Wool Combing Co.	Wool		15,000	Acid cracking- lagoons	1700		
Hardwick	Romar Tissue Mills	Paper			None		Needs solids removal	1965

WARE RIVER (cont.)								
Location (Municipality)	Name of Facility	Type of Waste	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed
Ware	Ware Woolen Company	Woolen textile	0.38	3150	None	3150	Connect to Municipi- pal sewerage system	1965
Ware	Essexshire Woolen Co.	Woolen textile	0.30	2400	None	2400	Connect to Municipi- pal sewerage system	1965
Palmer	Diamond National Corp.	Paper	0.5		None		Needs solids removal	1965
<u>SWIFT RIVER</u>								
Palmer	Vachon Paper Company	Paper	0.50				Needs solids removal	1965
<u>QUABOAG RIVER</u>								
West Brook- field	Capitol Yeast	Food mfg.	0.014		None		Needs secondary treatment	1965
Warren	Warren Laundry	Laundry	0.014	140	None		Connect to municipi- pal system	1965
Warren	Coia-O-Matic Laundry	Laundry	0.005	70	None		Connect to municipi- pal system	1965
Warren	Warren Fab- rics Co.	Synthetic Textile	0.045	600	None		Connect to municipi- pal system	1965
Warren	Wa.E. Wright & Sons	Cotton Textile	0.021	300	None		Connect to municipi- pal system	1965

CHICOPEE RIVER								
Location (Municipality)	Name of Facility	Type of Waste	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed
Wilbraham	Utility Mfg. Company	Plating					Needs plating waste treatment	1965
Springfield	Thal Dyeing Company	Wool finishing		1240	None		Connect to municipal system	1965
Springfield	Rugcraft	Rug Washing		240	None		Connect to municipal system	1965
Springfield	Monsanto Chemical Co.	Chemical		35,000	None			
Chicopee	U.S. Rubber	Synthetic rubber		9200	None		Connect to municipal system	1965
<u>WESTFIELD RIVER</u>								
Becket	Bancroft Paper Mills Corp.	Paper			Save-alls Lagoon		Needs additional solids removal	1965
Russell	Taxon Inc.	Paper			Save-all		Needs additional solids removal	1965
Russell	Westfield River Paper Company	Paper			Lagoon	0		
Russell	Strathmore Paper Co.	Paper		8000	None		Study completed- needs additional solids removal	1965
Westfield	Foster Machine Plating Company				None		Needs plating waste treatment	1965
Westfield	Stevens Paper Mills Inc.	Paper		10,000	None		Needs solids removal	1965

WESTFIELD RIVER (cont.)

Location (Municipality)	Name of Facility	Type of Waste	Average Daily Flow MGD	P.E. Before Treatment	Type of Treatment	P.E. After Treatment	Remarks	Abatement Program Constr. Completed 1965
Westfield	Westfield Mfg. Company	Plating			None		Needs plating waste treatment	
West Spring- field	Premoid Corp.	Paper		3,000	None		Study completed- needs solids removal	1965
West Spring- field	Strathmore Paper Co.	Paper		7,600	Save-all		Study completed- needs solids removal	1965
West Spring- field	Southworth Company	Paper		400	Save-all		Needs additional solids removal	1965

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH

RULES AND REGULATIONS
TO PREVENT
POLLUTION OR CONTAMINATION OF ANY OR ALL OF THE LAKES, PONDS,
STREAMS, TIDAL WATERS AND FLATS WITHIN THE COMMONWEALTH OR OF
THE TRIBUTARIES OF SUCH TIDAL WATERS AND FLATS

The Department of Public Health, acting under the authority of Section 5, Chapter 111 of the General Laws, appearing in the Tercentenary Edition thereof, as amended, and every other act thereto enabling, hereby prescribes and establishes the following rules and regulations to prevent the pollution or contamination of any or all of the lakes, ponds, streams, tidal waters and flats within the Commonwealth or of the tributaries of such tidal waters and flats.

1. No sewage and no human excrement or compost containing human excrement, and no house slops, sink wastes, or waste water which has been used for washing or cooking, or other polluted water, shall be discharged or put into any lake, pond, stream, tidal water and flat within the Commonwealth, or into a tributary of such tidal water and flat, except as may be approved by the Department of Public Health when in the opinion of the said Department the best practicable and reasonably available means to render harmless such sewage, human excrement, house slops, sink wastes, waste water or other polluted water have been provided in accordance with plans approved by the Department.

2. No garbage, manure, or other putrescible matter whatsoever, shall be discharged or put into any lake, pond, stream, tidal water and flat within the Commonwealth, or into a tributary of such tidal water and flat, except as may be approved by the Department of Public Health when in the opinion of the said Department the best practicable and reasonably available means to render harmless such garbage, manure, or putrescible matter have been provided in accordance with plans approved by the Department.

3. No manufacturing refuse, or waste product, or polluting liquid, or other substance which by itself or in combination with other substances is of a nature poisonous or injurious either to human beings or animals, or any putrescible organic matter whatsoever, shall be discharged or put into any lake, pond, stream, tidal water and flat within the Commonwealth, or a tributary of such tidal water and flat, except as may be approved by the Department of Public Health when in the opinion of the said Department the best practicable and reasonably available means to render harmless such manufacturing refuse, waste product, polluting liquid, substance, or putrescible organic matter, have been provided in accordance with plans approved by the Department.

4. No refuse, or waste product, or polluting liquid, or other substance of a nature poisonous or injurious either to human beings or animals, or putrescible organic matter whatsoever from a tannery, currying shop, or other establishment or place where the skin, wool, hair, or fur, of any animal is treated, or from a slaughterhouse or other building for carrying on the business of slaughtering cattle, sheep, or other animals, and no wastes from a pelting or rendering establishment

shall be discharged or put into any lake, pond, stream, tidal water and flat within the Commonwealth, or a tributary of such tidal water and flat, in a manner which may be injurious to the public health, or may tend to create a public nuisance, except as may be approved by the Department of Public Health when in the opinion of the said Department the best practicable and reasonably available means to render harmless such refuse, waste product, polluting liquid, substance, putrescible organic matter, or wastes have been provided in accordance with plans approved by the Department.

Prescribed and established by the
Department of Public Health at the
Meeting of its Public Health Council
held on Tuesday, August 14, 1945.

Approved by Governor and Council
on September 19, 1945.

PH-E-1000-7/61

Appendix II

Classification of Main Stem of Connecticut River

From the Deerfield River to the Holyoke Dam.

Present Condition	- Class C
Future Highest Use Classification	- Class B

From the Holyoke Dam to the Massachusetts-Connecticut State line.

Present Condition	- Class D
Future Highest Use Classification	- Class C

Approved by the New England Water Pollution Control Commission on March 24, 1955.

APPENDIX III

DEERFIELD RIVER

From Vermont-Massachusetts State Line to Monroe Bridge

Present Classification - Class B
Future Classification - Class B

From Monroe Bridge to confluence with Cold River

Present Classification - Class D
Future Classification - Class C

From Cold River to Deerfield Academy

Present Classification - Class C
Future Classification - Class B

From Deerfield Academy to confluence with Connecticut River

Present Classification - Class D
Future Classification - Class C

East Branch of North River from Vermont-Massachusetts line to Griswoldville Village in the town of Colrain

Present Classification - Class C
Future Classification - Class B

From Village of Griswoldville to the confluence with the Deerfield River

Present Classification - Class D
Future Classification - Class C

All ponds, streams and reservoirs and their tributaries which serve as municipal water supply sources - from their source to the downstream portion of the water supply works

Present Classification - Class A
Future Classification - Class A

Green River from the Vermont-Massachusetts State line to Silver Street, Greenfield

Present Classification - Class B
Future Classification - Class B

From Silver Street, Greenfield, to mouth at Deerfield River

Present Classification - Class D
Future Classification - Class C

All other tributaries to the Deerfield River

Present Classification - Class B
Future Classification - Class B

APPENDIX IV

PROPOSED CLASSIFICATION OF MILLERS RIVER

North Branch of Millers River from the Massachusetts - New Hampshire line to Winchendon Springs in the town of Winchendon

Present Classification	Class B
Future Highest Use Classification	- Class B

North Branch from Winchendon Springs to outlet of Whitney Pond

Present Classification	- Class C
Future Highest Use Classification	- Class C

Millers River from its source to Glenallen Street in Winchendon

Present Classification	- Class B
Future Highest Use Classification	- Class B

From outlet to Whitney Pond to Sibley Road in Winchendon

Present Classification	- Class D
Future Highest Use Classification	- Class C

Sibley Road to confluence with Otter River

Present Classification	- Class C
Future Highest Use Classification	- Class C

From confluence with Otter River to Royalston - Athol line

Present Classification	- Class D
Future Highest Use Classification	- Class C

From Royalston - Athol line to Brattle Street, Athol

Present Classification	- Class C
Future Highest Use Classification	- Class C

From Brattle Street, Athol, to confluence with Connecticut River

Present Classification	- Class D
Future Highest Use Classification	- Class C

Otter River from source to confluence with Pond Brook

Present Classification	- Class B
Future Highest Use Classification	- Class B

Pond Brook from outlet of Crystal Lake to confluence with Otter River

Present Classification	- Class D
Future Highest Use Classification	- Class C

APPENDIX IV

Otter River from confluence with Pond Brook to outfall of Gardner Sewage Treatment Plant

Present Classification	- Class C
Future Highest Use Classification	- Class C

Otter River from Gardner Sewage Treatment Plant to River Street, Templeton

Present Classification	- Class D
Future Highest Use Classification	- Class D

From River Street, Templeton, to Depot Street, Templeton

Present Classification	- Class C
Future Highest Use Classification	- Class C

From Depot Street, Templeton, to confluence with Millers River

Present Classification	- Class E
Future Highest Use Classification	- Class D

All ponds, streams and reservoirs and their tributaries which serve as municipal water supply sources - from their source to the downstream portion of the water supply works

Present Classification	- Class A
Future Highest Use Classification	- Class A

All other tributaries will be classified

Present Classification	- Class B
Future Highest Use Classification	- Class B

Classified by the New England Interstate Water Pollution Control Commission on June 27, 1961.

APPENDIX V

CLASSIFICATION OF CHICOPPEE RIVER TRIBUTARIES

SWIFT RIVER:

All of the Swift River watershed from its sources to Windsor Dam

Present Condition	- Class A
Future Highest Use Classification	- Class A

Windsor Dam to Boston and Maine Railroad Bridge above the Bondsville Village in Palmer

Present Condition	- Class B
Future Highest Use Classification	- Class B

From Boston and Maine Railroad Bridge, Palmer to its junction with the Ware River

Present Condition	- Class D
Future Highest Use Classification	- Class C

WARE RIVER:

From the Metropolitan District Commission intake in Barre to Route 32 Bridge in South Barre

Present Condition	- Class B
Future Highest Use Classification	- Class B

The Future Highest Use Classification from Route 32 in South Barre to the confluence of the Ware and Quaboag River is - Class C

The Present Condition classification follows:

<u>FROM</u>	<u>CLASSIFICATION</u>
Route 32, South Barre, Barre	
To Wheelwright Village, Hardwick	D
To Goddard Road, Hardwick	E
To Route 9, Ware	D
To Route 32, Ware (Gibbs Crossing)	E
To Thorndike St., Thorndike, Palmer	D
To Swift River Junction, Palmer	E
To Ware and Quaboag Confluence	D

QUABOAG RIVER

SEVEN MILE RIVER:

From source to Smithville Road in Spencer

APPENDIX V

Present Condition	- Class B
Future Highest Use Classification	- Class B

From Smithville Road in Spencer to junction with East Brookfield River in East Brookfield

Present Condition	- Class D
Future Highest Use Classification	- Class C

EAST BROOKFIELD RIVER:

From the outlet of Lake Lashaway to the junction with the Seven Mile River

Present Condition	- Class B
Future Highest Use Classification	- Class B

From the junction with Seven Mile River to the inlet of Quaboag Pond

Present Condition	- Class C
Future Highest Use Classification	- Class B

QUABOAG RIVER:

From the inlet of Quaboag Pond in East Brookfield to the junction with Dunn Brook in Brookfield

Present Condition	- Class B
Future Highest Use Classification	- Class B

The Future Highest Use Classification from the junction of Dunn Brook to the Ware and Quaboag Rivers confluence is - Class C.

The Present Condition classification follows:

<u>FROM</u>	<u>CLASSIFICATION</u>
Dunn Brook, Brookfield	
To Fiskdale Road, Brookfield	C
To Route 19, West Brookfield	D
To Route 67, Warren	C
To Gilbert Road, West Warren	D
To Chicopee Brook, Monson-Palmer	C
To Ware and Quaboag Rivers confluence	D

Dunn Brook from East Brookfield Road, North Brookfield to junction with Quaboag River in Brookfield

Present Condition	- Class D
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APPENDIX V

Future Highest Use Classification

- Class C

Chicopee Brook from State Street Monson to junction with Quaboag River

Present Condition

- Class C

Future Highest Use Classification

- Class C

APPENDIX VI

CLASSIFICATION OF WESTFIELD RIVER

West Branch of Westfield River from its source to Bancroft Road in the town of Becket

Present Condition	- Class B
Future Highest Use Classification	- Class B

From Bancroft Road, Becket, to confluence with Walker Brook

Present Condition	- Class C
Future Highest Use Classification	- Class B

From confluence with Walker Brook to confluence with Main River

Present Condition	- Class D
Future Highest Use Classification	- Class C

Middle Branch of Westfield River from its source to confluence with Westfield River

Present Condition	- Class B
Future Highest Use Classification	- Class B

Westfield River from source to junction with Middle Branch

Present Condition	- Class B
Future Highest Use Classification	- Class B

From junction of Middle Branch to Elm Street, Westfield

Present Condition	- Class D
Future Highest Use Classification	- Class C

From Elm Street, Westfield, to the confluence with the Connecticut River

Present Condition	- Class E
Future Highest Use Classification	- Class C

Westfield Little River from its source to the Dam at Intake Reservoir

Present Condition	- Class A
Future Highest Use Classification	- Class A

From Dam at Intake Reservoir to bridge at College Highway in Westfield

Present Condition	- Class B
Future Highest Use Classification	- Class B

APPENDIX VI

From Bridge at College Highway in Westfield to confluence with Westfield River

Present Condition	- Class D
Future Highest Use Classification	- Class C

All water supplies presently in use and having rules and regulations in effect from source to downstream portion of water supply works

Present Condition	- Class A
Future Highest Use Classification	- Class A

All other tributaries to the Westfield River

Present Condition	- Class B
Future Highest Use Classification	- Class B

Officially classified by the New England Interstate Water Pollution Control Commission at its meeting on December 12, 1961.

NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION
CLASSIFICATION AND STANDARDS OF QUALITY FOR INTERSTATE WATERS
 (As Revised and Adopted October 1, 1959)

CLASS A		CLASS B		CLASS C		CLASS D	
SUITABILITY FOR USE							
	Suitable for any water use. Character uniformly excellent.	Suitable for bathing and recreation, irrigation and agricultural uses; good fish habitat; good aesthetic value. Acceptable for public water supply with filtration and disinfection.	Suitable for recreational boating, irrigation of crops not used for consumption without cooking; habitat for wildlife and common food and game fishes indigenous to the region; industrial cooling and most industrial process uses.	Suitable for transportation of sewage and industrial wastes without nuisance, and for power, navigation and certain industrial uses.			
STANDARDS OF QUALITY							
Dissolved oxygen	Not less than 75% sat.	Not less than 75% sat.	Not less than 5 p.p.m.	Present at all times			
Oil and grease	None	No appreciable amount	Not objectionable	Not objectionable			
Odor, acum, floating solids, or debris	None	None	None	Not objectionable			
Sludge deposits	None	None	None	Not objectionable			
Color and turbidity	None	Not objectionable	Not objectionable	Not objectionable			
Phenols or other taste producing substances	None	None	None				
Substances potentially toxic	None	None	Not in toxic concentrations or combinations	Not in toxic concentrations or combinations			
Free acids or alkalies	None	None	None	Not in objectionable amounts			
Radioactivity	Within limits approved by the appropriate State agency with consideration of possible adverse effects in downstream waters from discharge of radioactive wastes; limits in a particular watershed to be resolved when necessary after consultation between States involved.						
Coliform bacteria	*Within limits approved by State Department of Health for uses involved.	Bacterial content of bathing waters shall meet limits approved by State Department of Health and acceptability will depend on sanitary survey.					

• See waters used for the taking of market shellfish shall not have a median coliform content in excess of 70 per 100 ml.

NOTE: Waters falling below these descriptions are considered as unsatisfactory and as Class E.

These standards do not apply to conditions brought about by natural causes.

For purpose of distinction as to use, waters used or proposed for public water supply shall be so designated.

MR. TAYLOR: Thank you.

MR. STEIN: Thank you, Mr. Taylor.

Connected to your statement is a table entitled, "Connecticut River Watershed, Significant Sources of Sewage Discharge," which lists municipalities, sewage sources, sewer population, and so forth, and the last column has been entitled "Abatement Program Construction Completed."

In addition to that, there are six appendices.

MR. TAYLOR: Yes. I might also say that there is appended a table following directly after the one you first mentioned relative to sewage discharges, the significant sources of industrial waste discharge, with a similar program indicated.

MR. STEIN: That is correct.

I think all of these will appear, without objection, in the record as read.

What about this last page?

MR. TAYLOR: I put that in for the benefit of those people who might know what the classifications were by number and by "A, B, C and D," but as to what they meant, they could refer to this thing (indicating).

MR. STEIN: Added to the appendices are the New England Interstate Water Pollution Control Commission classifications and standards of quality for interstate waters, as revised and adopted October 1, 1959.

Are there any comments or questions?

MR. ROGERS: I had possibly two or three, yes.

In the case of the City of Barre, is there a schedule on this one?

MR. STEIN: I wonder if you would speak up so that the audience can hear you on these questions.

MR. ROGERS: This is under the Ware River, the City of Barre. There is no abatement program date on this.

MR. STEIN: I understand that in the City of Barre we run a Federal service, and, as you might guess, Mr. Rogers was born and brought up in Georgia, which is the reason for his pronunciation of the name.

MR. ROGERS: I had two or three other questions, Mr. Chairman.

MR. TAYLOR: That is not within the area that you people are considering specifically, but I will pull that in and give it to you.

MR. STEIN: Yes. As I understand, the dates of completion on this both for industrial waste and municipal waste, the vast majority will be completed and in operation during 1965. Some will be completed and in operation in 1966.

I want to emphasize this: This is for both municipal and industrial treatment to meet the requirements of Massachusetts.

MR. TAYLOR: I might say that for those who have a copy of the tables, under the Chicopee River, the significant sources of industrial waste discharge, Chicopee being the last at the bottom of the page, there is an error in typing which reads "1968," and it is supposed to be "1966."

MR. STEIN: Do you have any other questions?

MR. ROGERS: On Page 2 you mentioned the use of these waters for public water supplies. Do you anticipate any use of the main stem of the Merrimack in the immediate future for water supply purposes?

MR. TAYLOR: I think you are referring to the Connecticut, are you not? It says "The Merrimack."

MR. ROGERS: Yes.

MR. TAYLOR: No, we do not.

MR. ROGERS: How about the tributaries? Are those sources of pollution?

MR. TAYLOR: We have no idea that the Connecticut River is going to be used as a source of water supply for any community within the Connecticut River Valley in the foreseeable future, but the only instance that I see any possibility of is on the tributaries up in Westfield, which will be used specifically by the City of Springfield and by any other community in that Westfield River Valley that wants to make use of it. Now, the City of Springfield plans to use a water supply pool from the Littleville multi-purpose use reservoir for water supply purposes approximately 20 years hence. However, in the authorization for a water supply on this stream for the City of Springfield, it was provided that any other city or town in that area could utilize the same source of water supply upon a contract agreement with the City of Springfield.

MR. ROGERS: The steps that are being taken by the Attorney General's office on Westfield are now proceeding?

MR. TAYLOR: They are at the moment sitting on the desk of one of the Assistant Attorney Generals, who is preparing all of the data necessary for presentation to the court.

MR. ROGERS: I believe there is a schedule for Westfield, isn't there?

MR. TAYLOR: Yes.

MR. STEIN: Any other questions, Mr. Rogers?

MR. ROGERS: One question in connection with low-flow regulations.

There are no projects under construction to provide for low-flow regulation or storage for low-flow regulation on any of these rivers?

MR. TAYLOR: No, there are none at the present time.

I don't know whether I am misleading you, because the dam that is being built at Littleville will provide minimum low flow for discharges.

MR. STEIN: For the purpose of continuity, I had a question here largely for clarification, and rather than raise this later, maybe we can put it all in one place in the record.

You had a statement in your presentation where you said it may be necessary for the Commonwealth to purchase water rights which it has previously allocated to industrial establishments.

Are those really allocated under the State law system of allocation as they have in the West, or do they just take it?

MR. TAYLOR: The law in Massachusetts gave a legal right to these people to take it, and thus obtain a legitimate title to this by a certain procedure which they follow in most instances.

There may be some instances where all of the requirements of the law were not followed, but primarily any industry in Massachusetts obtained a right to these waters upon the building of a dam and the purchase of the land that would be flooded by such waters. This is the procedure by which they have obtained title. When the Commonwealth of Massachusetts has wished to utilize these waters for other resources that were normally available to that industry, it had to buy it.

As an illustration of that, you have the Quabbin Reservoir. When the reservoir was built as a source of water supply for the City of Boston and the communities around Boston not on the watershed of the Connecticut River, we had to buy it. They had that right that these people had assumed by building these dams.

MR. STEIN: I hope we are not getting too technical, but in dealing with streams in modern times, we are more and more dealing with regulated streams. Very few streams in the future will be these natural free-flowing streams with periods of droughts and floods. There will be some sort of regulatory device on them.

Now, the problem that we have here is that most of the industries do have what we call a non-consumptive use. Most industries other than, say, irrigated agriculture and cities for that matter, when they are taking their water, return 90 percent of the stream.

If you are going to interrupt the flow of a stream, then this would be some kind of a dam. This generally does not happen in manufacturing plants or plants that just use water for cooling purposes?

MR. TAYLOR: Right, but it does in many instances where there are no waters for dilution if you wish to put a sewage treatment plant effluent into the stream. Also, it is damaging to a fish program, to wildlife programs of the area as well. If you have a stream in which you have a portion that may be miles long in which there is no water, you cannot expect to develop fish migration and things of this nature.

In one instance that we have that we are dealing with at the present time, an industry has to consider the building of waste abatement programs, pollution abatement programs in a stream that varies from almost zero flow to flood flows in a matter of a few minutes, and this makes an almost impossible situation to comply with.

No. 1, you don't know what flows to design for dilution purposes; and,

No. 2, you do not have any dissolved oxygen coming to you to assist in the assimilating capacity of the stream.

MR. STEIN: By the way, I think that is a very lucid explanation of what happens with the diminished flows.

Obviously, no kind of treatment known to man can support fish life if he is going to cut off all the water and have the stream dry up into just a few pools. All

the aquatic life will die, and the food that the fish depend on is dying off. Then even if the water does come in you have broken that life cycle, and it takes time to get back.

What I was getting at was, I wondered how prevalent this was with industry here. Generally speaking, when industry takes water we don't have a diminution of the water. The water is taken into the plant, used in the process and discharged.

Generally speaking, the place where you have this diminution is with dams or power companies.

Is this the case here?

MR. TAYLOR: Yes. It has always been the case with dams or something of this nature in this valley, to my knowledge.

There is an exception in another river valley that we would be considering, and that is where there were so many wells that are drilled right alongside of the river, that we have dried up the river in periods of low flow, and, of course, it would return to the river at a point far below.

MR. STEIN: The reason I raised this here -- and if you will let me put this out for the State agencies and the people concerned -- is that under the 1961 amendment to our Act, we also have a program to provide additional storage capacity in Federal impoundments and reservoirs precisely for this purpose, to release water for water quality downstream. This is something very, very new. You could release water for navigation or power, but until very recently you could not release it just to improve the quality of water in the stream.

However, this cannot be a substitute for adequate treatment, and I am quite sure that given a situation such as is described here in Massachusetts, unless Massachusetts has a program to reclaim the water rights which have taken up and have interrupted the flow, that the Federal law can be used as a substitute for that. I think this is the real problem we are going to have to look into.

MR. ROGERS: I have just a related question.

When you speak of allocated water for industries, this pertains to industrial uses plus power development?

MR. TAYLOR: Yes. They use this water for any purpose that they see fit.

MR. STEIN: Are there any other questions?

MR. ROGERS: Mr. Chairman, there is one possible correction, I think, on Appendix II, on the classification. I have a question.

Shouldn't this be "D" and "C"? This is on Appendix II, "Classification of main stem of Connecticut River from the Holyoke Dam to the Massachusetts - Connecticut State line."

MR. TAYLOR: Yes, that is correct. Appendix II does read incorrectly. That is a typographical error.

I don't know why we didn't catch it ourselves.

MR. STEIN: This is a typographical error. We will just correct it so that it will appear correctly in the record.

Are there any further questions?

MR. ROGERS: No.

MR. STEIN: I wonder if I might ask, when you talk in terms of chlorination in the recreational season, what do you mean by "the recreational season"?

MR. TAYLOR: Normally we refer to from May 15th to September 15th.

I have, however, noted in the presentation of the Department of Health, Education and Welfare or the Public Health Service that the use of the river for recreational purposes begins on May 1st, if I am correct in reading and hearing what was said. I am sure that Massachusetts is willing to change its schedule of when chlorination should start from May 15th to May 1st, if this covers the recreational season in the Connecticut River Basin.

MR. STEIN: I don't know that there is any dispute on that.

I have another question for clarification. When you are talking about treatment for the municipalities in particular, you generally are referring to primary treatment plus chlorination during the recreational season?

MR. TAYLOR: On the communities on the main stem of the river, this is true.

However, this is not so for the treatment plants designed and built on the tributaries. Where the tributaries have lesser flows it is frequently desirable and we have required the construction of secondary works and chlorination.

MR. STEIN: But chlorination is required in all cases?

MR. TAYLOR: That is true.

MR. STEIN: Where you indicated that certain plants have chlorination equipment, I think by implication others do not. Does your schedule mean that chlorination equipment will be in effect and operating by the 1965 or 1966 dates you have indicated?

MR. TAYLOR: By the time of the indicated dates. That is right.

MR. STEIN: Everyone will have chlorination equipment?

MR. TAYLOR: Yes.

MR. STEIN: The type of industrial treatment will be commensurate with your classification and will not interfere, in your judgment, with legitimate water uses?

MR. TAYLOR: That is correct.

MR. STEIN: That is what is contemplated with industrial treatment?

MR. TAYLOR: That is correct. There can be no overall statement as to what is going to be required for each individual plant because of the nature of the effluents, the volume of the waste, the character of the waste, the continuing capacity of the stream.

MR. STEIN: I think I might comment here, at least from looking at the Federal position, a time schedule of two years from those dates in large measure -- and in some cases three -- seems to be a very, very reasonable time schedule in order to achieve abatement. I think the key point in this program is that sometimes even the most

accelerated program -- it seems that this proposal meets all the requirements of an accelerated program -- takes so long that sometimes it is hard to see the improvements or the developments of improvements which take place.

I think this is a significant statement by both the interstate agency and the State of Massachusetts.

Do you have anyone else you want to call on, Mr. Taylor, or anything more to say?

MR. TAYLOR: I have nothing further to say, Mr. Chairman.

Mrs. Bernard Flood of the League of Women Voters of Massachusetts, a member of the Board of Directors of the League of Women Voters of Massachusetts, has a statement she would like to make.

STATEMENT OF
MRS. BERNARD H. FLOOD
MEMBER OF THE BOARD OF DIRECTORS OF THE LEAGUE OF WOMEN VOTERS
OF MASSACHUSETTS

MRS. FLOOD: During the years that the League of Women Voters of Massachusetts has worked on water problems it has come to know the State officials who have responsibility for water. We know their dedication to their jobs. Therefore, we appreciate their invitation to appear at this conference since they know that the league is concerned about the increasing pollution of our rivers.

As early as 1896 Massachusetts established the Department of Public Health which soon created the Bureau of Environmental Sanitation. It was made responsible for enforcing the regulations to prevent pollution; yet we still have gross pollution in many stretches of our rivers, particularly the Connecticut. Why is this so?

This has perhaps resulted from the emphasis, at least until recently, on the protection of health as the only, or chief, reason for pollution abatement. Municipalities and industries have both failed to do their full part to make the waters and shores of the Connecticut not only free of health menace, but also available for the many other increasingly important demands on the river.

Noting the progress made in domestic sewage treatment we would say that if the needs and responsibilities are recognized, the full job can be done. As you gentlemen know, the City of Northampton was ordered to build sewage treatment facilities, and although citizens and officials alike felt it would be impossible economically, the plant was built and the city is still solvent. Other communities have been so ordered and had the same experience.

In WPA days the City of Springfield first built a sewage treatment plant which has been revised many times since. It was not until Public Law 660 provided incentive funds that other towns began treatment, namely, Agawam, Longmeadow, and West Springfield. Holyoke and Chicopee have plans and Westfield has been ordered to provide facilities. To quote the League of Women Voters of Springfield:

"Progress has been slow. Our league agreed during the four year study that the Massachusetts Public Health Department should put more pressure on communities not building sewage treatment plants since there is a law in Massachusetts requiring pollution abatement. Communities are prone to spend their monies on other things. It is gratifying to see how PL 660 has stimulated the building of such plants."

The fact that Chicopee and other municipalities are hoping for grants under accelerated public works raises the question of what will happen if these are discontinued.

Thus the consciousness of the need by officials, the wherewithal to satisfy the need through help under Public Law 660, and possibly accelerated Public Works, and the pressure from State agencies backed by laws, have had salutary effects in the domestic sewage programs. This reflects a growing acceptance of the idea that sewage treatment is an essential part of the cost of municipal water supply.

We recognize that the problems that industries face are different from those of municipalities in the treatment of wastes.

I think our problem has been compounded in Connecticut by the fact that industries came here hundreds of years ago and were permitted to use the river as they saw fit. There was very little population to be concerned about.

Notwithstanding important technical advances in industrial waste treatment, some industrial processes still defy solutions which are at the same time fully adequate and cheap. Industry does not have the advantage of a Federal incentive program. Chapter 539 of Massachusetts Statutes 1961 permits industry to remain exempt from taxation on any equipment facility, or device installed on or attached to real property for the purpose of abating or preventing pollution of any stream, pond, lake, tidalwater or flats.

I can't say of my own knowledge how much industry along the Connecticut has taken advantage of this. I live on the Housatonic, and I know of two industries which are currently providing for pollution abatement facilities, and they hope to receive some tax abatement.

Once industry and the consumer accept the underlying concept that waste treatment is an essential part of production costs, the costs can surely be met, notwithstanding competitive pressures.

Although the pace is slow some industries are taking more effective steps toward cleaner water, especially when municipalities have installed or are about to install sewage treatment plants.

Areas of Immediate Concern

Our view is that in the last few years great strides have been taken in pollution abatement, but there are still several matters of immediate concern to league members.

The first is with the application of the classification system. It appears very difficult to get higher classifications for stretches of the river. Classifications are determined by existing inefficient plants. This leads to serious problems. The river attracts only those new industries which will accept low classification. New treatment plants are usually built to meet low classification at the time of the building. This makes it virtually impossible to raise the classification at a later date. We feel strongly that unless Massachusetts, and the other Northeastern States, take a more forward-looking view for this area, the whole program will be self-defeating.

The second deals with the attitude that the river can and should be used for carrying off untreated or partially treated wastes. Have other methods of disposing of waste really been examined? Are they really so expensive in the long run? We understand many industries have developed profitable by-products from wastes, and a few cities are experimenting with new types of treatment. To make waste removal a major use of the river reduces other possible uses, which are likely to have equal or greater economic value. We back this up by saying not all of our cities are on rivers, and somehow they manage.

Thirdly, the plans that are approved by the appropriate agencies are usually timid. They accept primary plants instead of urging secondary, or, better still, tertiary treatment. Also they are usually constructed without providing adequately for population growth. This leads to plants becoming overloaded, polluting the river again, and becoming obsolete before they should. Better studies should be done in this area.

We say this with a great deal of humility, because we realize how difficult this particular problem is. It is the way our population seems to be working.

Fourthly, the Commonwealth of Massachusetts has not accepted its full responsibility for pollution control. Matching funds for Federal programs have not always been provided, nor has there been any State-initiated grant program to municipalities for treatment plants. Most, if not all, of the State agencies have their programs severely hampered by lack of funds for research and for personnel.

Members of the League of Women Voters of Massachusetts think that the water of the Connecticut will have to be reused more and more as population and industry grow, that polluted water will retard economic growth and that the cost of overcoming pollution will be a sound investment for the future. Clean water is important not only for water supply, but also for living in pleasant surroundings, for recreation and for wildlife. The demand for these amenities is increasing rapidly. We are told that new industries seeking a place to locate often take these factors into account. The tributaries of the Connecticut as well as parts of the river itself have great recreational potential. Pollution continues to destroy this major asset.

In closing, I am sure that I speak for an increasingly large number of Massachusetts citizens who belong to such groups as watershed associations.

Now, I think this is probably the best thing that has come out in a long, long time. This is the booklet (indicating) put out by the Connecticut Watershed Association, and if it has the vast distribution that they hope it will have, I think you will find that the State officials are going to be backed up by the citizens in doing something about clean water in Connecticut.

As I say, we feel we represent conservation organizations, sportsmen's clubs, women's clubs, garden clubs, service clubs and individuals outside such organizations, as well as members of the League of Women Voters, in stating that there are many citizens of Massachusetts who want pollution kept out of our rivers and are willing to back the Massachusetts Department of Health in a stronger pollution control program. We also welcome the impetus and direction to citizen action which we hope this conference will give.

MR. STEIN: Thank you very much, Mrs. Flood, for a very excellent statement.

Are there any comments or questions?

(No response.)

MR. STEIN: The League of Women Voters is really becoming very sophisticated in this field and I would personally underscore your one point. I think this applies to us as well as the States, and that is the plans are usually very timid.

For a peculiar reason, in waste treatment we deal with something which seems to become obsolete very, very quickly. If we look at the type of building that is done on bridges or on highways, or possibly the amount of money the Americans put into their family automobiles, and then look at the waste treatment facilities, you can easily see what the situation is. This may very well be part of our problem.

I don't know that we in the Federal Government are any less to blame than the States are, but I think any elevation must come from the people themselves to get this done. I don't think you really have the large profit motive. As a matter of fact, the push is the other way, to keep expense down. It is up to you.

MRS. FLOOD: We would agree with you on this; It is not a very popular subject.

MR. TAYLOR: Mr. Harold E. Irwin, who is the Chairman of the Clean Waters Committee, Quabbin Chapter of the Izaak Walton League.

STATEMENT OF
HAROLD E. IRWIN, CHAIRMAN
CLEAN WATERS COMMITTEE, QUABBIN CHAPTER
IZAACK WALTON LEAGUE OF AMERICA, INC.

MR. IRWIN: Mr. Chairman, members of this committee:

As Chairman of the Clean Waters Committee of the Izaak Walton League, Quabbin Chapter, I have been directed to submit this analysis.

The Quabbin Chapter, Izaak Walton League of America, Inc., IWLA, is made up of the leading conservationists in the communities of the Chicopee River Basin. In the short first year of its existence, the Quabbin Chapter has preempted the role of leadership among conservation organizations in the Connecticut River Basin.

The leadership of the Quabbin Chapter has during the past few years filed and supported legislation to accelerate the abatement of pollution in Massachusetts. In addition to its support of State and national legislation, the Quabbin Chapter has been active at local levels among the communities of the Chicopee, Ware, Swift and Quaboag Rivers, showing the film entitled "Waterbill U.S.A." and distributing clean waters literature to over 12,000 people.

The leaders of the Quabbin Chapter have participated in the National Conference on Water Pollution, where views of hundreds of State water agency people were sounded out. The Chapter was the first conservation organization in Massachusetts to conduct "Workshops for Water Pollution Monitors" and the first to implement a program of water pollution monitoring of the waters of the Chicopee River Basin.

Forty-two years of leadership by the League in the pollution abatement fight nationally has resulted in the refinement of a water pollution policy of singular soundness and commends itself to Federal, interstate, State and local governments.

The Quabbin Chapter concurs with the national policies of the League in that the public good demands (1) the maximum removal of pollutants from all streams rather than use water to carry waste; (2) that pollution control is rightfully a Federal, as well as a local, State and interstate responsibility; (3) that where State and local units fail in pollution control, the Federal Government should have clear authority to strongly enforce pollution abatement and prevention; (4) that it is the duty of every industrial concern to treat its wastes, and it is the responsibility of industry -- not government -- to discover methods of treating its wastes; and (5) that it is the clear responsibility of every municipality to provide adequate treatment of its sewage.

The Chicopee River and its tributaries of the Ware-Swift-Quaboag Rivers, which empty into the Connecticut River, are made up almost entirely of Class "D" and Class "E" waters, carrying more pollution than any other tributary and should be the target of an integrated control effort by local, State and Federal governments, as well as by industry itself.

The Chicopee River from Ludlow to its confluence with the Connecticut carries the highest concentration of sanitary and industrial waste of any stream in the watershed. It is a dead stream, easily rating as Class "E", with no use to man and constitutes the most unsuitable environment for fish, wildlife and water based recreation.

Sanitary, industrial and agricultural pollution enters the Chicopee River without any restraint in the stretch from Ludlow, through Wilbraham and Palmer.

The tributaries of the Swift, Ware-Quaboag Rivers converge on the village of Three Rivers in Palmer as Class "D" and "E" waters, bringing untreated sanitary and industrial wastes from Bondsville on the Swift, from Barre on the Ware and from the Brookfields on the Quaboag Rivers. These waters are usually distinguished by an extremely offensive odor and coloring. Fish kills are a common occurrence during summer months.

The waters of these tributaries, by volume and temperature, could support an enormous fish population were they to be free from pollution. Bathing, boating, water supply, industrial and public health values would be greatly enhanced by the improvement of water quality.

State and local efforts have made little progress in abating pollution in the Chicopee River Basin. For the most part, the local Health Boards seem to have relinquished their responsibility in the area of control and enforcement. State progress has been singularly slow also.

The State has not been able to deal firmly with those municipalities which openly declare their intention to stall. State action is almost ineffective in dealing with the City of Chicopee. Integration of the State and Federal effort becomes imperative in such cases.

Progress is lagging in Indian Orchard, Wilbraham, Palmer, Monson, the Brookfields and Barre. Some of these municipalities have not even received a letter from the State Health Department to plan for the control and treatment of pollution. Only a vigorous intercession by the Quabbin Chapter could pry loose a letter from the Massachusetts Health Department directing the town of Hardwick to clean up the pollution entering the Ware River in the village of Gilbertville.

The leaders of the "Sewage Treatment Study Committees" in Ware and Warren report that without the extra inducement represented by the 20 percent of Accelerated Public Works Funds, the recent votes by the town meetings to build treatment plants would never have taken place. It is also the firm belief of these leaders that a time-table of State action might have taken perhaps five years.

It is singularly significant that there is no evidence of strong, persuasive State action toward any reluctant community in either the Chicopee Basin or in any other New England community of the Connecticut Watershed.

The Izaak Walton League has worked since its founding 42 years ago to improve the quality of our nation's waters and has been among the most effective supporters of a strong Federal enforcement program on interstate and navigable waters.

Since State work with industry is at a standstill, the Quabbin Chapter of the Izaak Walton League of America, Inc., strongly urges the United States Department of Health, Education, and Welfare, to take the lead in furnishing industry with the guidelines to curb its discharge of wastes in the waters of the Connecticut Watershed.

Thank you, gentlemen.

MR. STEIN: Are there any comments or questions?

(No response.)

MR. STEIN: If not, thank you very much for a very complete statement.

MR. TAYLOR: Would you ask if there are any others from Massachusetts?

MR. STEIN: Yes. Are there any other people from Massachusetts who wish to be heard?

STATEMENT OF
RICHARD P. SCHUHLEN, CHAIRMAN
IZAACK WALTON LEAGUE OF AMERICA, SPRINGFIELD CHAPTER
SPRINGFIELD, MASS.

MR. SCHUHLEN: The gentleman before said most of what I had to say.

At any rate, you can talk all you want right here and now, but in the last two years or three years I haven't seen any improvement anywhere. Westfield is just as polluted as it ever was -- in fact, I guess it is worse right now than it ever was; and the Chicopee River all the way down -- all the way down from the Swift River -- is a crying shame.

In fact, I had Mr. Pellitan there in September to take a look at the Chicopee River, and he spotted one spot there where they put tar in, and we spotted about six or seven sewers with raw sewage coming right into the Chicopee River. Then there was the plant down there discharging some raw stuff out of there into the river.

All along the river, you go down there and especially in the summertime when you get a good, hot day, the stench would drive you out of there.

All I can say is not to waste too much time. The Springfield Chapter of the Izaak Walton League wants to go on record.

MR. STEIN: Do you want to put that letter into the record that you have?

MR. SCHUHLEN: It would do no good because I didn't say anything on it.

MR. STEIN: No. Let it appear in the record.

MR. SCHUHLEN: All right.

MR. STEIN: Why don't you give it to the reporter?

MR. SCHUHLEN: All right.

(The letter of the Springfield Chapter of the Izaak Walton League is as follows:

"SPRINGFIELD CHAPTER

Izaak Walton League of America
142 Meadowbrook Ave., West Springfield
Massachusetts 01089

"To Secretary of Health, Education and Welfare
Conference on Pollution Abatement
Federal Post Office Bldg.
135 High St., Hartford, Conn.

"Dear Sir:

"The Springfield Chapter of Izaak Walton League of America, in operation since 1928, oldest chapter in New England, has been the leader in pollution abatement in this area for 35 years.

"Committees investigating pollution of the Connecticut River and its tributaries in Massachusetts, the Deerfield, Millers, Westfield and the Chicopee (Ware, Swift and Quaboag) rivers, in 1963 found little or no improvement in water conditions and estimate that there has been an increase in the amount of domestic waste and industrial pollutants in these waters.

"Many of the municipalities are dragging their feet in undertaking projects to eliminate pollution of these waters and industries are doing practically nothing but adding to the variety and amount of waste going into these waters.

"The Springfield Chapter of Izaak Walton League of America, has approved the following policies as regards the waters of Western and Central Massachusetts:

"Ideally, all water should be fit for direct human use -- drinking, swimming, esthetic enjoyment -- without special treatment, and it will then also be eminently suited for municipal, agricultural and industrial utilization.

"The public interest requires that Man shall not act to so pollute his environment that it is rendered unfit for his direct use or esthetic enjoyment, or to so pollute the environment of fish, wildlife, and other organisms, that they are destroyed in substantial numbers over large or small areas.

"The public goal should be maximum removal of pollutants from all streams, rather than use the streams to carry an "acceptable maximum" load of wastes.

"Since water course know no political boundaries, pollution control is rightfully a Federal as well as a local, State and interstate responsibility. Although control measures should be initiated at the lowest effective level, the Federal Government should have clear authority to strongly enforce pollution abatement and prevention in cases when lower authority proves ineffectual or inadequate.

"It is the clear responsibility of every municipality to provide adequate treatment of its sewage.

"It is the duty of every industrial concern to treat its wastes, and it is the responsibility of industry -- not government -- to discover methods of treating its wastes. The costs of pollution research and treatment are rightful production costs. Reasonable time for development of treatment methods should be given industry, but it should be borne in mind that there is no disposal problem, in this age of science, incapable of satisfactory solution.

"The Springfield Chapter of Izaak Walton League of America strongly feels that the Massachusetts top authority, the Massachusetts Department of Public Health, is not strongly enforcing pollution abatement and prevention and that the lower authorities are not taking steps to stop pollution effectively and adequately. The waters of the Connecticut River and especially the tributaries today definitely prove this point.

Respectfully submitted by
Richard P. Schuhlen
Chairman of the Springfield Chapter
of Izaak Walton League Clean Waters Committee."

MR. STEIN: Thank you very much.

MR. SCHUHLEN: You are welcome.

MR. TAYLOR: Mr. Westphalen?

STATEMENT OF
HERBERT J. A. WESTPHALEN, PUBLICITY CHAIRMAN
LUDLOW CONSERVATION COMMISSION
LUDLOW, MASSACHUSETTS

MR. WESTPHALEN: I am Herbert Westphalen, Ludlow Conservation Commission, also a member of the Springfield Chapter of the Izaak Walton League.

We have learned a lot about how dirty we are up in Massachusetts, and it is true.

There have been great strides taken in the last few years, but again we don't have the push that is necessary to put this thing over.

Clean water, in my opinion, is something that is a natural resource that we must guard very carefully.

The Town of Ludlow created a Conservation Commission in May 1963, investigating pollution, and finds that due to the rapid growth in population, there are many areas without sewerage, resulting in the need of septic tank installations. This in some cases was the contributing cause of pollution to the river.

We feel that a vigorous program of law enforcement by local, State and Federal departments, a program of conservation education, the posting of all waters found to be unsafe for public use, and through the media of local newspapers acquainting the public to the classification of each body of water and its safe use, if any, should do much to expedite pollution abatement.

Every assistance by State and Federal governments should be given, at no cost, to every conservation commission, so that their efforts in conservation will be effective for the betterment of mankind.

MR. STEIN: Thank you.

MR. WESTPHALEN: Thank you, sir.

MR. STEIN: Does anyone else for Massachusetts wish to be heard?

STATEMENT OF
LEONARD J. COLLAMORE
ADMINISTRATIVE AIDE TO MAYOR RYAN
SPRINGFIELD, MASSACHUSETTS

MR. COLLAMORE: Mayor Ryan asked me to come here and apologize, first of all for being unable to be present here this morning, Mr. Chairman.

The City of Springfield is vitally concerned and is committed to its duties and responsibilities in the solution of the pollution problem in the Connecticut River.

The City of Springfield, as has been mentioned here in much of the material brought before the Commission today, already has a number of sewage plants being operated at the present time.

On May 21, 1962, Mayor Ryan wrote to Dr. Alfred L. Frechette, Commissioner, Department of Public Health, Commonwealth of Massachusetts:

"The City of Springfield is interested in as speedy a clean-up of the river as is possible," and asked for other information.

He has met a number of times with the State agencies concerned with this problem.

He asked me to inform you that he gives his wholehearted endorsement to this conference and to a speedy solution to this program.

MR. STEIN: Thank you. I can speak from personal knowledge of that. At least, we have had representatives who had meetings with the people in Springfield, and I know Senator Kennedy also has had them. They have always evidenced a willingness to do the job of abating pollution, recognizing the problem and understanding that their future rests upon a clean river in the Connecticut River Valley.

MR. TAYLOR: Are there any others?

STATEMENT OF
ROBERT HAFEY, EXECUTIVE DIRECTOR
OF THE CITIZENS' ACTION COMMISSION
SPRINGFIELD, MASSACHUSETTS

MR. HAFEY: I am Robert Hafey, Executive Director of the Citizens' Action Commission, of which Roger Putnam is the Chairman.

He asked me to come down here. He feels very much interested in action --

MR. TAYLOR: Is this for the City of Springfield?

MR. HAFEY: That's right, the City of Springfield.

MR. STEIN: I can assure you from the Federal level -- and I know what your problem in Springfield is, and in Connecticut as well -- we are committed to doing anything the law will allow. You know that legislation is up before the Congress now.

MR. HAFEY. Yes, sir.

MR. STEIN: Thank you. If that is all, we will check the equities of this.

We are going to adjourn for lunch. Here is our problem: The conferees, other than myself, must be on an airplane this evening and must leave here at four o'clock.

In other words, let's try to be back as soon as we can, but we are going to start immediately and I say positively on this at a quarter to two. I confidently expect we will be able to finish in time, by four o'clock, without rushing anyone, and giving everyone a full hearing.

I ask you again to recognize the commitments that these conferees have, to leave here at four o'clock. This was made by a national organization, and the conflict has come up, because sometimes these things will happen where you have competing groups moving in on the same dates. I do know that their engagement is very important and it is vital for them to be there.

I ask your cooperation to be back promptly this afternoon, at which time we will hear from Connecticut. We will have the discussion and the summary and then I think we will be on our way.

Thank you very much.

(Whereupon, at 12:50 p.m., the conference was recessed.)

AFTERNOON SESSION

1:45 p.m.

MR. STEIN: May we reconvene?

Mr. Wise of Connecticut.

STATEMENT OF
WILLIAM S. WISE, DIRECTOR
CONNECTICUT WATER RESOURCES COMMISSION

MR. WISE: My remarks are going to be made from the standpoint of one who has been connected with a State regulatory agency for some thirty-five years, from one who has been bombarded by many people who say that something should be done and we must do something, but their activity usually ends with those statements.

I am also going to make the remarks from the standpoint that there are practical considerations in a program of this sort that must be considered, and I hope I will be somewhat constructively critical about the report.

As one connected with both State and interstate water pollution control agencies I feel confident in stating that we are well aware of the condition and degree of pollution which exists in one of the State's most beautiful rivers -- the Connecticut. We appreciate its assets and its liabilities. We are striving earnestly to achieve the maximum improvements in the quality of its waters within, the State and interstate reaches, while recognizing that practical and economic limitations will govern the final results. We are cognizant of the excellent progress made, particularly during the past few years, in its pollution abatement and the coordinated efforts now being made toward even greater accomplishments in the near future. We realize that no State agency can concentrate its energies or its allocated funds in one river valley to the exclusion of similar needs throughout the State. We are confident that if this cooperative effort can pursue its course, without disruption, the Connecticut River will be restored to its ultimate highest degree of quality with the expenditure of less tax dollars than can be achieved through a crash program or one that is not prudently formulated.

The Report's Deficiencies. The "Report on Pollution of Interstate Waters of the Connecticut River" made in preparation for this conference is of interest for many reasons, among which should be noted: It does not represent a balanced picture of the river's condition but purports to show it in the most unfavorable light. It leaves the inference that pollution has robbed the river of all its normal useful purposes. The report places great emphasis on the question of recreation, and in that it ignores the fact that, in the reach above Hartford, shallow water, exposed river bed, shoals, topography and physical conditions greatly restrict its use for waterborne recreational activities during most of the recreation season. It appears to discount the habits and customs of the large percentage of people in this area who prefer sandy beaches and salt water to muddy river beds even if the fresh water is clean. It neither presents meager data nor offers criteria in support of its conclusion that the river's condition endangers the health and welfare of the people of Connecticut, nor does it offer any interpretation of the statement. It leaves the inference that the simple process of sewage treatment and chlorination would rid the water of coliform organisms and ignores the impractical aspects of controlling the frequent contamination of the river during periods of rain and natural drainage from the many municipalities and agricultural

lands located along its banks. No conclusions are expressed as to whether the river can be made safe for the health and welfare of the people or the problem to be encountered in endeavoring to accomplish such a result. Finally the report does not acknowledge the progress that has been made in pollution abatement along the entire river, the activities which are now directed toward accelerating these programs or the policy for achieving the ultimate goal -- a river of beauty utility and enjoyment.

A formal hearing for the purpose of considering the pollution of this great river and its effect upon the health and welfare of the people of this State should consider all phases of the numerous problems involved and a report should not be confined to only a few aspects of the conditions.

Connecticut's Many Waterways. Connecticut is not an impoverished State from the standpoint of a lack of clean streams for water supply, recreation and other uses. There are approximately 8,400 miles of rivers and streams in the State of which nearly 6,000 miles are clean and of a quality suitable for all uses -- incidentally, a large percentage of these streams are small and of limited usefulness except for esthetic purposes. 1,800 additional miles are of a quality suitable for all recreational uses. The remaining 600 miles, or less than 8 percent, of the total mileage, receive the large percentage of the pollution load -- the 70-mile reach of the Connecticut River is in this category. The State also contains 245 miles of shore line with over 20 miles of fine recreational beaches, many recreational boating areas and shellfish grounds, and 1,000 lakes or bodies of water suitable for and used for many purposes.

While pollution may restrict the usefulness of some of our rivers for some purposes it does not seriously deprive many people from enjoying the numerous other valuable water resources or appreciably affect their welfare.

Connecticut's Water Pollution Control Program. Three large, beautiful and valuable interstate rivers flow through Connecticut and terminate on its Long Island Sound shore line. The protection of these valuable assets and the development of their maximum potential benefits has long been a primary concern of the State. It not only took early steps toward abating pollution in all the waterways within its boundaries, but it was also an early sponsor of the interstate compact seeking similar cooperation and progressive action on interstate streams. This has proven to be a most valuable undertaking.

Connecticut has a good and effective water pollution control law, a progressive policy and administrative agencies -- Water Resources Commission and Department of Health -- dedicated to clean up the State's waterways in an orderly and comprehensive procedure. Together their efforts have been successful in achieving the construction of 975 plants treating approximately 95 percent of the sewage produced in the State and 217 plants treating 51 percent of the State's industrial wastes. Obviously there is still much to be accomplished and therefore the policy and programs are directed toward the construction of plants for treating the remaining untreated sewage by the year 1970 and treatment of the remaining industrial wastes by 1975.

In this program, the Farmington River, which is the main tributary of the Connecticut, lying within Connecticut, is scheduled for a clean-up program by the end of 1965.

Warehouse Point, which is the one remaining small community that is discharging untreated sewage, will be scheduled as soon after 1965 as the Federal grant allotments program will permit.

In the hope of meeting this schedule and in an effort to minimize construction delays due to the limited availability of Federal construction funds, a policy has been

adopted for allocating these funds so as to assure the construction of the largest number of plants per year.

When this stage is reached it will complete the first phase of the program -- the initial treatment of all wastes. Progressive steps will then be followed for carrying out the program's second phase, which will involve the installation of higher degrees of treatment at those locations where primary treatment plants are in operation and refinement of presently installed secondary treatment plants. Further efforts will be directed toward separation of combined storm and sanitary sewer systems and minimizing sewage overflows into the State's waterways.

This is the goal. When it will be reached will depend upon the influence of a number of factors. With the increased interest in water pollution control today and the appearance that everybody is trying to get into the act, it would seem to be a comparatively easy undertaking. Unfortunately too many of those, in the act, merely indulge in general criticism, lip service or complacent utterances that "something must be done" or "we must do something about it." Money, not lip service, is needed to build and operate pollution control works and, therefore, "money raisers" must be recruited in place of "arm-chair" supporters.

Conclusion. A review of the report prepared for this conference, the circumstances surrounding the pollution of the Connecticut River and the program for abating this condition, naturally suggests several general conclusions: The lack of supporting data for the report's contention that the pollution of the Connecticut River endangers the health and welfare of persons in Connecticut may be due to the difficulty in assembling such data; the technical and engineering aspects of controlling such pollution are not problems of major concern as compared with those surrounding the financial aspects; the cooperative programs adopted by the State and interstate agencies are sound and effective and geared to the initial abatement of such pollution in the immediate future, with subsequent steps for greater improvement in water quality. It would appear, therefore, that the best procedure for abating pollution in the Connecticut River would be to encourage rapid progress under the present State and interstate programs with maximum participation by Federal agencies in the financial aspects of the program. Money is the critical need.

MR. STEIN: Are there any comments or questions?

MR. ROGERS: I have a question.

Mr. Wise, the cities actually won't go ahead unless they get Federal funds? Warehouse Point won't, for example?

MR. WISE: That is the generally accepted view.

MR. ROGERS: Now, in this area that we are talking about, all of the cities on the Farmington will meet the 1965 schedule?

MR. WISE: That is what we are planning on.

MR. ROGERS: Warehouse Point will be an exception unless you get funds?

MR. WISE: Yes. We have set up our Federal construction grant priority list on the basis of allocating the necessary funds to the Farmington River Valley to complete these plants by the end of 1965.

MR. ROGERS: Do you have any cities under a court order in the Farmington River Valley?

MR. WISE: Not in the Connecticut River Valley. We have in other parts of the State.

MR. STEIN: Mr. Wise, you heard Mr. Taylor's forecast for the clean-up, and you recognize the areas mentioned and covered by the report by Mr. Kittrell.

As I understand it, by 1965, those communities in the Connecticut River Valley in Connecticut will be receiving the same kind of treatment, at least, or a commensurate kind of treatment as they will in Massachusetts?

MR. WISE: With the exception of Warehouse Point, and that one is due, I think, largely to the fact that it would be difficult to schedule Federal construction grants to get that plant installed before 1965.

MR. STEIN: When do you think that will be?

MR. WISE: We are committed to committing this money so tightly within two years, that I don't believe it will be within two years.

MR. STEIN: No, but can you give an estimate?

MR. WISE: Well, if I was forced to give an estimate, I would say 1967.

MR. STEIN: Well, that is a relatively small operation.

MR. WISE: It is a relatively small operation, and a relatively expensive one for the community involved.

MR. STEIN: I would like to go off the record here.

(Discussion off the record.)

MR. STEIN: Are there any other comments or questions?

MR. ROGERS: I have a couple of other questions.

MR. STEIN: Yes, Mr. Rogers.

MR. ROGERS: Are the industries going to meet roughly this same schedule now?

MR. WISE: Well, the industries will certainly meet the general schedule for the State as a whole. I can't make any commitments for a while, but it will be as a whole.

MR. STEIN: In the Warehouse Point operation, where does the waste come from? Is there any State or Federal installation involved?

MR. WISE: There is a State installation there.

MR. STEIN: How much of the load comes from the State installation?

MR. WISE: Probably between a quarter and a half of the load.

MR. STEIN: The point is, I can understand if half the loading comes from the State installation, that it might be well to let the State contribute. This is a problem for the Federal or State installation.

Isn't that a problem of financing that we might approach to get this perhaps in consonance with the other areas?

MR. WISE: Well, I think we should point out that an engineering report has been made on this problem and a recommendation, but it was largely a question of finances in getting the thing under way.

MR. STEIN: I recognize it is a question of finances. We have had this problem with Federal installations and State installations, and at time both Federal and State, and I recognize that financing is very, very difficult. However, in other States, where they have had State or Federal installations, we have managed to try to work out a situation there where we could get a joint kind of financing.

Is it expected that the State will contribute to this with respect to the financing on Warehouse Point?

MR. WISE: I can't answer that.

MR. STEIN: I know. This is a legislative matter, but in many, many States, obviously where a State installation is putting in about half the load, to expect the people in that area to absorb the per capita cost often does not prove to be workable. I think one of the most difficult problems we have in financing is getting appropriations either from the Congress or a State legislature to dovetail with private financing to handle one of these cases.

Now, just so that we can be abundantly clear on what the Federal problem is, I would like to point to the map.

If you look at that map, above the State line, we can only under the Federal law, unless we were invited in by the Governor of the State -- and we were not invited in in Connecticut by the Governor of the State -- deal with pollution from one State which endangers the health or welfare of persons in another State.

Sometimes this is a relatively simple operation where a river forms a border between two States and each State pollutes the other; but, as you can see by looking at this map, the jurisdiction the Federal Government has is over Massachusetts pollution as it may endanger the health or welfare of persons in Connecticut.

However, I think we are dealing here with a question of equity too. We cannot and we will not ask Massachusetts to clean up its pollution to have clean water flow down to the State line just to have it polluted below. There is no sense in that.

In other words, we have to come up with a coordinated program, and I think Connecticut, on its own, if they can expect Massachusetts to adhere to its program -- and you have heard Massachusetts' program -- has to match it.

This is the program that Connecticut has to match. We are delighted to hear that they have a coordinated concept and that the water will not be deteriorated in Connecticut after it receives its treatment in Massachusetts. I think this is possibly the best kind of a State cooperation, and perhaps a good deal should be said for Mr. Joseph Knox of the New England Interstate Commission, and for both States, in achieving this.

Are there any other comments or questions?

(No response.)

MR. STEIN: Do you have anyone else to call on?

MR. WISE: I would like to call on Commissioner Franklin Foote, Commissioner of the State Department of Health.

STATEMENT OF
FRANKLIN M. FOOTE, M.D.
CONNECTICUT STATE COMMISSIONER OF HEALTH

DR. FOOTE: Mr. Stein, I am Dr. Franklin M. Foote, the State Commissioner of Health.

For more than 60 years the Connecticut State Department of Health has been deeply concerned about the pollution of the Connecticut River. We are troubled about the possible transmission of intestinal disease to those who swim in the river contrary to the advice of health departments on both banks; about the necessity of closing off areas at the mouth of the river between Old Saybrook and Old Lyme for shellfish culture and gathering; about the effects of pollution on reducing use of the river for such recreational purposes as fishing and boating; and about the possible long-range uses as a source of water for industry and for drinking water. Such use for drinking water is not concentrated at the moment, but it may be in another 30 or 40 years.

In Connecticut this concern is shared with the State Water Resources Commission, which has entire statutory responsibility over the discharge of industrial wastes and which cooperates with this department in making studies of the quality of the river as it passes through Connecticut and in bringing about improvements in municipal sewage treatment plants.

Sampling. For many years the State Department of Health and the Water Resources Commission have been taking samples of water at various points along the river. In comparing bacteriological samples for 1946 with 1962, we find that the median numbers of most probable number of coliform bacteria per 100 milliliters of water were as follows:

	1946	1962
Thompsonville Bridge	11,000	46,000
Bulkeley Bridge, Hartford	14,300	46,000
East Haddam Bridge	1,600	4,600

Although the above figures would indicate possibly a wide worsening in 1962 compared with 1946, we do not feel that the differences are great enough to justify this conclusion. Even though six or seven samples were taken at each point each year, at various seasons, differences of 24 to 48 hours in sampling, we have found, can make the differences shown in the above table for 1962 compared with 1946.

However, we do feel there has been a consistent showing that within the State of Connecticut there is some improvement in the water by the time it gets to East Haddam and then on into Long Island Sound. This improvement has come about because several of the communities have constructed primary sewage treatment plants, and some of these chlorinate the sewage during the summer months.

Despite these improvements, the water in the entire Connecticut River has had too high a bacteria count to permit its use for swimming. In determining whether to approve a body of water for swimming we use as a bacteriological standard the most probable number of less than 1,000 coliform organisms per 100 milliliters over a period of time as recommended by the Joint Committee on Bathing Places of the American Public Health

Association and the Conference of State Sanitary Engineers. In everyday language this means only those places with fewer than 40 bacteria of intestinal origin in each teaspoon of water are approved for swimming.

Since 1955 we have also been taking samples of water for radiological testing at six stations on the Connecticut River, and two, incidentally, on the Farmington, and we have found no evidence at any time of any possible danger to health from this cause.

Complaints. We periodically receive complaints of odors from the Connecticut River, particularly during the dry season we receive complaints of gross evidence of sewage and of oily wastes at various points along the stream.

To correct these conditions it will be necessary to continue vigorously the marked improvement that has already taken place and is actively planned within Connecticut and Massachusetts in enlarging or installing sewage treatment plants, in treating industrial wastes, and in changing from primary to the vastly superior secondary method of treatment in municipal plants, with chlorination during the summer months. We are pleased that the Metropolitan District Commission of the Greater Hartford Area is studying this aspect of the problem as well as improving the existing plant so it can be in operation throughout the year rather than closed down for about three months each year as at the present time, because of the river level.

Cooperation. By statute the Connecticut State Commissioner of Health is a member of the New England Interstate Water Pollution Control Commission along with four other persons from Connecticut, a cooperative commission authorized by Congress and supported by the State with some Federal funds.

Our experience over the years with this commission has demonstrated that it is moving forward effectively in obtaining cooperation from all of the States involved in bringing about improvements in the Connecticut River.

Through the New England Interstate Water Pollution Control Commission there has been admirable cooperation from the Public Health Service, which for many years has had responsibility for assisting in the control of water pollution.

This assistance has been so capable and so effective that I would urge, Mr. Stein, modification of that part of S. 649 which has been introduced by Senator Muskie and which would remove responsibility for water pollution control from the Public Health Service and place it in an entirely new agency.

In water pollution control programs public health has and should be of the highest priority. The very real interest that the Public Health Service has always shown in increasing recreational activities along these rivers likewise deserves consideration in determining whether water pollution should be administered at the Federal level by that agency created by Congress to manage public health matters.

With the remainder of S. 649, other than this change, I would be in strong support. The record of the Public Health Service in water pollution control is of such excellence, its long-range plans so merit support as well as its ability to move swiftly when the occasion requires, that any concession of political expedience at the expense of the program would seem most undesirable. I would therefore urge support in the Department of Health, Education, and Welfare for the Public Health Service program of water pollution control and for keeping its administration in that agency which has shown so well its ability to attack the problem.

MR. STEIN: Thank you, Dr. Foote.

Are there any comments or questions?

(No response.)

MR. STEIN: There is one point in particular I would like to emphasize that you mentioned at the beginning. That is the potential use of the Connecticut River as a source of water supply, and with this possibility in the near future I think we should listen very carefully to what Dr. Foote had to say.

In analyzing the sources of water supply throughout this country, we have found that as the population grows, really the only dependable source of water supply is the surface water supply. In other words, it has to be a river or a lake and not a well, to oversimplify it.

The farther this water supply is from the point of intake, the more expensive it obviously is, and the more acute is your possibility of controversial litigation.

We have looked at the legislation out West. I know it is not as sensitive here, but if you ever look at the controversies between California and Arizona, or the controversies that there have been in the Supreme Court, where the situation was brought up regarding the providing of water for Boston and Massachusetts which prevailed in this situation, you realize that whenever you take water out of a watershed and pump it somewhere else you always have a very, very serious problem.

This area is going to grow, which is inevitable as our country grows and as you get more population here in the Connecticut Valley. As a man who travels throughout the country regularly, I don't think there are very many more beautiful spots than the Connecticut Valley. Obviously, this is a natural place for industrial and population growth.

It seems that the pressure for the use of the Connecticut River for a water supply, your surface water supply, is going to be inexorable. This is something where, while we are not considering it here, I think Dr. Foote put his finger on it. In the development of this you must -- must -- must always keep this in mind.

Remember that the Colorado River, which is outside the basin, provides the drinking water for about 10 million people in Southern California. There has been a great deal of travail, litigation and expense.

We just think that a city like Boston or a city like New York has to get its water where it can get its water. New York, for one reason or another, doesn't or can't use the Hudson River flowing by its door.

I think your cities here of Springfield and Hartford and other cities, with a river like this flowing by their doors, might want to consider what the future is going to hold.

Now, on that other point which you raised, on the legislation, we will be glad to call this to the attention of the Secretary. I think the Secretary has taken a position on the legislation.

DR. FOOTE: Yes. I know he has before the Senate.

MR. STEIN: Which is not inconsistent with what you have reported.

DR. FOOTE: Yes, that is correct.

I might say, as far as Hartford is concerned, by the way, that they are pretty well fixed for sources of water for a number of years to come.

The Metropolitan Commission here takes a very long-range view, and nobody has to dash home today and fill his bathtub for fear that they are going to run short. However, down in Middletown, a city of around 30,000 or so, they have had difficulties recently and, of course, this is an area where we are building a brand-new highway, Route 91, between New Haven and Hartford. The State is also building Route 9, which will go all the way down to Old Saybrook. This is going to open up that area for many more people, and it may be along that section that there will be problems. In the immediate Hartford area I would like to put in a good plug for the Metropolitan Commission. They do a good job looking ahead to the future.

MR. STEIN: Thank you.

Are there any other comments or questions?

(No response.)

MR. STEIN: Thank you.

DR. FOOTE: Thank you very much.

MR. WISE: I would like to recognize Mr. Arthur W. Sweeton, Chief Engineer of the Metropolitan District of Hartford.

STATEMENT OF
ARTHUR W. SWEETON, III
DEPUTY MANAGER AND CHIEF ENGINEER
BUREAU OF PUBLIC WORKS, METROPOLITAN DISTRICT
HARTFORD, CONNECTICUT

MR. SWEETON: Mr. Stein and ladies and gentlemen of this conference:

This is a brief letter statement in response to Mr. Wise's request.

To the Honorable Anthony Celebrezze, Secretary, United States Department of Health, Education, and Welfare, Washington, D. C.

"My Dear Mr. Secretary:

"We have noted the steadily increasing interest, and attention to, water pollution and its control on the part of many persons or parties, including the individual taxpayer and user of the natural rivers and streams, and the responsible town, city and state agencies, and our federal government.

"In our own area with a population of about 300,000 in the seven towns comprising the Metropolitan District of Hartford County, Connecticut, we have made good progress in that our 500-mile water pollution control or sewerage system, costing our taxpayers upwards of \$43,000,000, is serving reasonably well and adequately the public needs and demands to date.

"We are also planning ahead and expecting to recommend in 1964 and subsequent years that our taxpayers appropriate many more millions of dollars of money to further improve the sewage effluents now discharged into the Connecticut River.

"As we noted in a letter of October 3, 1963, to The Honorable Robert E. Jones, United States Representative and Chairman of the Natural Resources and Power Subcommittee of the Committee on Government Operations, we have employed sanitary engineering consultants to prepare a design study and report on further expansion and improvement of the District's sewerage system and pollution control plants.

"We anticipate that our consultants will recommend that one or more of the following sewerage construction projects be undertaken in due time by the Hartford Metropolitan District and its taxpayers:

"1. PUMPING FACILITIES for all dry weather flow through the Hartford sewage treatment plant during Connecticut River flood.

"2. CHLORINATION facilities.

"3. Additional PRIMARY SEDIMENTATION TANKS at the Hartford plant, and at other plants as needed.

"4. Initial REGULATION to minimize overflow of sanitary sewage, and ultimate SEPARATION of the old Hartford combined sewer system.

"5. Additional DIGESTION TANKS at the Hartford plant.

"6. SECONDARY TREATMENT at the Hartford plant, and at smaller plants as needed.

"We anticipate that appropriate scheduling of these construction projects will accomplish the Hartford area's share of water pollution control and its resulting improvement of the classification of the Connecticut River.

"We note with interest, and with some concern, that the Federal Government is investigating the possible needs for improvement of the Connecticut River.

"It is of real interest that the Federal Government may be able to assist in increasing ways. We have started a list of suggestions, on the attached sheet, of Possible Federal Participation in Water Pollution Control, a list which may include assistance already actively undertaken.

"It is of some concern that Federal appropriations for loans or grants to date, while small in amount relative to the needs as a whole, have both encouraged starting plans and some construction in some areas, but have also apparently stopped progress in other areas which may be marking time in the hope of further Federal grants.

"To conclude, we believe our taxpayers will be willing to continue to do their part toward improvement and increased enjoyment and use of the Connecticut River in whatever practical ways the State and Federal Government and our own Metropolitan District may advise."

I might read the list, which is not an authoritative list. It is what we gained in talking these problems over together, and it may or may not have value.

"1. Monitor water quality in all large rivers and communicate results to State, City, Town or District agencies responsible for water pollution control.

"2. Promote a standard definition of water quality classification systems throughout the United States.

"3. Research, and communicate results to all concerned, the capacity of the rivers themselves for assimilation and improvement of sewage effluents.

"4. Research relative danger to public health (both from future potential and from records of illnesses to date) of contact including swimming in stream classifications Class A, B, C and D.

"5. Research, and communicate results to the public and to all interested parties including State, City, Town or District agencies responsible for water pollution control, practical and economical methods of improving effluents from water pollution control plants, and from combined sewer overflows in older cities, so that the Connecticut River, or any other river, could be improved in classification from Class D to C or to Class B, if desired by the taxpayers.

"6. Lessen Federal Income Tax on private industry which has installed adequate water pollution control plants."

There has been talk about an incentive for industry, and there has been lots of talk of how to try it.

"7. Make money available for assistance in construction of water pollution control facilities to areas having financial needs in excess of the benefits to

be gained by the area itself."

MR. STEIN: Thank you.

Are there any comments or questions?

(No response.)

MR. STEIN: As you know, a good many of these points are either being done or being considered by legislation. Some of them are fairly controversial.

MR. SWEETON: Yes, I understand.

MR. STEIN: As a matter of fact, your Nos. 2 and 3, for example, Dr. Foote mentioned the new Muskie bill, which will take care of Nos. 2 and 3.

I suspect many of the other State agencies, although I am not sure about the ones represented here, approve of the provisions of the Muskie bill, but I think all of your suggestions are pertinent.

I would really like to ask one question, if I may.

Do you have any notion what the separation of storm water and sanitary sewers would cost?

MR. SWEETON: Not a very precise one -- just many millions of dollars. I think we made an estimate in correspondence with the United States Conference of Mayors one or two years ago, which was 22 million and up.

MR. STEIN: 22 million and up. I know that the United States Conference of Mayors' figure was used as the basis for the legislation in the Senate.

There is a provision at least in the Senate bill, which would, on an experimental basis, authorize \$20 million for demonstration and research in preparation of storm water sewers. I would suggest if you have a program and also if -- and this is a big "if" -- if the legislation passes, you might want to keep that in mind, because I think there is a growing recognition of the storm water separation program. This may be something where you may see if you can take advantage of it.

Obviously, with the almost astronomical cost of separating sanitary from storm water sewers, and only \$20 million being made available and authorized, not too many areas are going to be within the first wave. These probably will be picked rather selectively and on a basis where they can demonstrate something if the program proves successful.

MR. WISE: Mr. Stein, I would like to ask Mr. Sweeton to explain a little more fully what he means by the second recommendation, by standardization of definition classifications.

MR. SWEETON: Well, as I understand it, there may be a certain definition here in Connecticut and in Massachusetts for Classes A, B and C of the streams, and may be slightly different definitions in other parts of the country. In our business and in our communications it might be helpful if these definitions were standardized throughout the country so we could all talk the same language.

MR. WISE: You are not advocating standard classifications for the whole country?

MR. SWEETON: I am not suggesting that the Government set up those. No. This is

just for assistance.

MR. STEIN: Well, I think we are all agreed with that.

I think that is a problem here -- and again I know, dealing within a particular area of the country you are apt, because you deal with classifications, to think that the classifications of streams are universal.

In some parts of the country the word "classification" or the approach to this is an anathema.

The problem that we have on the Federal level, if we are recognizing the primary rights and responsibilities, is a question of letting a State determine itself whether it wants to engage in a classification system at all -- a standard system at all -- whether you want effluent standards, stream standards, or whether you want to have a uniform system of classification.

Up to the present time we have not been able to get agreement, and I say aside from the New England area -- and I think these people should be complimented -- we have not been able to get agreement for a classification as a desirable thing in any area in the country. On the question of communications, as to when to mention it, the word "classification" is like waving a red flag in front of these people, because it is not the same. We haven't even got agreement on classifications within the State agencies.

Again, given our system of government and given the law that we have with the primary rights and responsibilities for pollution control resting in the States, we have generally considered the question of whether the State wanted to classify it or not to be a State matter, and solely within a State.

For the Federal Government to go in and begin to go into definitions, which people think is a wrong area to go into, would perhaps be considered in any case as undue infringement on State prerogatives. That is why I just asked for your thinking on it because I recognized that in New England you have a relatively cohesive situation.

MR. SWEETON: Mr. Stein, you spoke a moment ago about the separation problem.

This, of course, is a great problem, and as I gather, your Government agencies, your whole sanitary engineering field, is not quite sure what is the best solution. They simply know that this is a solution, and a very expensive one, and so expensive that they haven't dared to tackle it.

This Muskie bill has perhaps been partly held up because of this lack of sureness as to what is the solution.

This leads to the suggestion that here is where efforts should be concentrated, on what is the solution for this separation problem.

If the Government or anyone collectively can help find this quickly, that would be fine. We ourselves have almost been forced to start separation, because it is the only solution at the moment. We have to undertake rebuilding some of our older combined sewers for lack of capacity or for deterioration, or for relocation in the face of highway projects, flood control projects, redevelopment, and so forth, so we have had to decide shall we rebuild our combined system or shall we lay the new pipe to fit in later with the separated system. We have chosen the latter.

We are not sure that that is the eventual solution, but we thought we would be

worse off if we did not do this.

MR. STEIN: I couldn't agree with you more. This is the dilemma. The Muskie bill took that attitude. This is the dilemma in the Muskie bill, providing the program for four years with the notion that they would try to devise the best method of dealing with the separation problems, the questions that we are faced with here. I hope all of you understand this separation of storm water and sanitary sewers. If any of you don't, will you please raise your hand and we will give you a one-minute explanation of it.

The dilemma we are faced with is not that there isn't a solution to the problem, but the solution is so expensive. Not only is it expensive, but in dealing with a city like Washington, D. C., in order to do that, we would practically have to close the city to all automobile traffic for fifteen years, if you were going to try to do it. The cure is worse than the disease.

The question here is -- and I think the Muskie committee came up with the compromise -- that if there is no break-through or solution on the horizon, do we say that because it is so we don't start?

I am not providing an answer to this or taking any position. I am just giving you the question.

If we have a twenty-year or twenty-five-year program, do we wait and live with this for the twenty-five years and not do anything and, no matter how much we put into our sewage plants, and how many millions we put in, will we always be plagued with the pollution problems; or be in the hopes that some solution would come up; or is the thing to do to take the plunge and say that maybe this is going to take twenty-five years, but if we don't start now we are not going to do it?

I think the answer to this question -- and maybe I will go a little on one side -- is that this is something we all have to think through.

I am reminded of one of the late President's famous stories that he used to tell about the French marquis who wanted to do some planting, and he was in his seventies. They suggested that the plant or the shrub he was going to put out ordinarily wouldn't bloom for forty years and he probably wouldn't be around to see it. He said, "Well, what are we waiting for? Why don't we plant this now?"

I don't know if we are ever going to get at this storm water separation sewer program unless sometime we say, "Why don't we get at it now?"

Just because the answer is a very difficult one, we should not wait for the millennium to come and figure we are going to have a very easy answer.

MR. TAYLOR: May I just say a word in regard to this?

MR. STEIN: Yes.

MR. TAYLOR: This may be too early to be remarking on it, because we are going to be holding a conference of a similar nature on the Merrimack River within the next few months, and on the Merrimack River we have found, from engineering studies, that it is going to cost approximately \$45 million to provide treatment for the overflows from combined sewers. That is so far lower than cost of separation, it seems to be the only possible program.

Here is a cost of \$45 million for three communities to provide treatment only with chlorination of the combined overflow, and the cost of separation we don't know exactly, but it is probably well over \$100 million for these communities.

So we are stating that the primary objective in this area is to take care of the dry weather flow as the first step, which is going to cost us some \$94 million, and leave the combined overflows untreated for the immediate future.

MR. SWEETON: In our case, we have had to ask the question whether the existing combined systems will need rebuilding shortly, because if it does, that might have a great effect on the answer.

MR. STEIN: By the way, I don't know if you are familiar with the District of Columbia program.

MR. SWEETON: Yes, I am.

MR. STEIN: That program is to lay separated sewers every time they lay a new sewer, or they tear up a street for repaving, and they are gradually getting at this separation.

I did not mean to suggest, Mr. Taylor, that the only solution to this problem is a separation.

MR. TAYLOR: Yes.

MR. STEIN: What I am suggesting is a determination of the best evidence be made available at least within the reasonable future to get at the problem, and we not wait for a magic answer which may never come.

MR. TAYLOR: That's right.

MR. STEIN: Thank you very much.

MR. ROGERS: May I ask one question?

MR. STEIN: Yes.

MR. ROGERS: Mr. Sweeton, are all of these necessary to meet the C classification?

MR. SWEETON: We don't know yet, and we hope to be able to tell in our consultant's report.

MR. ROGERS: All right.

MR. STEIN: Thank you very much, Mr. Sweeton.

MR. WISE: Is Mr. Gill in the audience -- Commissioner Gill or his representative?

(No response.)

MR. WISE: Commissioner Gill indicated he would like to make a statement.

For the record, he is a Commissioner of the Department of Agriculture and Natural Resources of this State. He apparently is not present.

Is there anyone else from Connecticut who would like to make a statement?

STATEMENT OF
EARL R. HOWARD, EXECUTIVE ENGINEER
BUREAU OF PUBLIC WORKS, METROPOLITAN DISTRICT
HARTFORD, CONNECTICUT

MR. HOWARD: I would like to make a couple of remarks.

MR. STEIN: Identify yourself, please.

MR. HOWARD: I am Earl Howard. I am Executive Engineer of the Metropolitan District. I am also President of the New England Water Pollution Control Association.

Our New England Water Pollution Control Association is made up of a group of consulting engineers, municipal officials, and treatment plant operators, and we meet a couple of times a year and have technical sessions. I would like to speak from that standpoint, as well as a private citizen's standpoint, and just bring out the point here that there are two things that I hope we don't miss in all of this.

First, as Mr. Wise mentioned, the cost of this thing is going to be fabulous.

With reference to Federal support, it is the times that have gotten us into this Federal support situation, as I see it. This has come in highways. It is now beginning to come into our field, and I agree with Mr. Wise that for a small community the size of Warehouse Point, perhaps without Federal funding they are up against an impossible situation, so that we are going to need Federal aid and help in this thing.

With respect to the Connecticut River, it occurs to me that we should not lose sight of the degree of upgrading of that stream that is going to be mandatory.

I fail to see why, all of a sudden, you are going to have to make a mountain spring out of the Connecticut River. I feel, and I think that many people feel, that we, the public, have the right to some usage of that stream in an assimilative capacity. If industry can use it, I think we, the public, in the sewage field also should have some call on the river.

You can see from the figures presented in the reports here this morning, it does have an oxygen sag in the below Springfield, Massachusetts, area, but it has pretty good recovery. We have been sampling the river ourselves this summer in connection with the report that our consultant, Mr. Sweeton, made.

So I think it is important not to lose sight of the degree. Somewhere somebody has to say how much can we get for the dollars we are going to spend, and how much can we saddle the taxpayer with. It is fine to say that you can get Federal funds to do all this. Just don't forget where those Federal funds come from. This is not a panacea. It is out of your pocket and my pocket.

All I ask is that we get the best we can buy for the dollars we spend, because it is your money and my money, even though it comes by way of Washington.

Thank you.

MR. STEIN: Thank you, Mr. Howard.

Are there any comments?

(No response,)

MR. STEIN: Only one thing: I am a little confused and I am not sure that I quite understood. The Interstate Commission seems to think that this would be reasonable for the Connecticut River --

MR. HOWARD: I agree. That's right. My mountain stream allusion was merely the fact that I hope you people are not going to tell us eventually we have to take out every ounce of pollution there is. There must be some use here which we are entitled to as residents in the area.

MR. STEIN: Off the record.

(Discussion off the record.)

MR. STEIN: Mr. Wise?

MR. WISE: Is there anyone else in Connecticut who would like to express his views, or make a statement?

(No response.)

MR. STEIN: Is there anyone else who feels he wants to make a statement?

(No response.)

Closing Statement - Mr. Stein

MR. STEIN: If not, let's see if we can have the discussion and the summary at the same time.

The summary will reflect what is determined here. Sometimes we find that while we cannot get complete agreement on the statements of the effect of pollution, I think we can get agreement on the proposed remedial action. This very well may be the case here. As long as we do that, I find, at least in my experience, that in most cases we have an equitable solution to the operation if the people on all sides agree that such workings are going to be put in by a certain time, and we are all pretty much agreed that improvement and non-interference with legitimate water uses will be maintained.

I think it is fair to say that the Connecticut River is an interstate river within the meaning of the Federal Water Pollution Control Act, and that communities and industries within both States contribute to the pollution endangering health or welfare, which is subject to abatement under the Federal Water Pollution Control Act, specifically the communities named in Mr. Kittrell's report -- I won't go through them now, to save time -- and the industries in Massachusetts contribute sewage and industrial waste, which interferes with the use of the Connecticut River in Connecticut with relation to water contact sports, recreation and the propagation of game fish.

The report indicates that health hazards are involved in the use of water for recreation, and that suspended solids from sewage and industrial waste cover the river bottom and interfere with fish spawning, the development of insects, larvae and other aquatic life which serve as food for fish. As a result, desirable sport fish do not exist in many areas of the Connecticut River. In addition, gases of decomposition of sludge cause clumps and allow rafts of sludge to boil to the surface, where they are esthetically offensive, and visual evidences of pollution diminish the beauty of the water and are offensive esthetically. These include cloudy and grayish appearance of the water in the vicinity of sewage and industrial waste discharges, intermittent colors of dyes from industrial wastes, small grease balls, bits of human excreta, and so forth, and intermittent oil films on the surface of the river, and combinations of algae, oil and other floating materials, causing a green scum at the water lines of boats moored on the river, and causing hardship in removing accumulations from boats.

I think that the report shows that the contributions from below the State line in Connecticut are substantial, and therefore for an effective abatement of pollution which will not endanger health or welfare of persons in Connecticut caused by discharges in Massachusetts, there would have to be a clean-up in Connecticut as well as in Massachusetts. It would not be a really useful act to have Massachusetts clean up and have the present discharges continue unabated in Connecticut.

Cognizance is taken in the report of the cooperation and the active programs of Massachusetts, Connecticut and the New England Interstate Commission. Cognizance is also taken of the fact that in 1955, the Commission classified various portions of the interstate reaches of the Connecticut River covered by this report.

The report also shows that pollution would be substantially abated if the conditions or the classifications were met.

I believe also that a time schedule was put forth by Massachusetts and by Connecticut indicating that almost all of the municipalities and industries would provide adequate treatment by 1965; that a few places in Massachusetts, as indicated on their tables, would be completed in 1966; and that in Connecticut, Warehouse Point might be completed after 1965.

That is for municipalities, and this would include either adequate primary or secondary treatment as required by the State, with adequate chlorination during the recreation season from at least May 1st to September 15th, and that industrial waste would be incorporated or caused to flow in and be treated in municipal systems, or where they had separate discharges, such industrial wastes would be treated, so as not to interfere with any of the legitimate water uses named in the appropriate classifications for those waters.

There is one more point. I think the other point is that in order not to wait until 1965 to see whether the program is going forward, again it is suggested that possibly a yearly report of progress be prepared in cooperation with the interstate agencies, the States and us, to indicate what progress is going to be made; and, since this is the end of the year, the first yearly progress report to be due in January of next year.

That is at least the way I see this.

MR. ROGERS: What did you mention?

MR. STEIN: That should be January 1965.

MR. TAYLOR: Mr. Stein, I think you have done an admirable job in summarizing all of this thing, except that I don't agree with you on one point.

I cannot agree with you that the present program or the present operation is affecting the health and welfare of the people of the State of Connecticut. I think that the report of our colleague, Mr. Wise, has indicated otherwise. So has that of Mr. Knox, and I personally do not agree with you.

I believe at this time that the conference should be concluded; that we should have a clear understanding that this conference might be reopened for cause -- it would be a new conference; that is, not a continuation of this one -- and that this one be dead at this time.

We recognize that the States and the interstate agencies have a program which they intend to carry out, which, if they carry it out according to schedule, will result in a water quality that is suitable not only to the interstate uses of this thing, but of local concern, and in which we are particularly interested at this time.

I agree heartily with the idea of primary treatment and chlorination.

I would like to point out one thing: I would not like to see a result of this conference to be that the Federal Government recommended and caused the States to comply with its annual report. I believe that this was a recommendation of the State, and that you recognize that the States agree to do this, rather than it being one of the results coming out of the recommendations of the conference,

MR. STEIN: I think we have several points to clarify.

The last one is correct. We would say that the recommendation of the annual report was a suggestion of the State and voluntarily put forth by the State. This was a State idea, and I did not mean to imply otherwise.

As to the next point, let me make this clear: We lawyers have a phrase called "ultra vires," which means "beyond our power."

I don't know whether I can conclude the conference. I am pretty sure I can't. This is a power that the Secretary alone has. He has not delegated that power to me.

I will tell you this, though: It is my recommendation that if the schedules of remedial work agreed on here or put forth here today are adhered to, I certainly would not recommend that the conference be reconvened.

We have had many, many of these conferences involving 500 cities and 500 communities, but I think in no case, and this I can assure you, have we ever recommended that a conference be reconvened, except for real outstanding cause, or where this was requested by the States and interstate agencies, and we came back. It is not our policy to reconvene the conferences. I wish I could say something definite on it being concluded, but this is beyond our power.

Again, as this program continues, I have worked on this through five Secretaries. Each Secretary is different. But I will say this: I have not seen any Secretary we have had up to this point really eager to reconvene conferences, except when requested by the States, or where there was cause. As a matter of fact, I do not recall any conference -- and I may be mistaken on this -- ever being reconvened without unanimous consent of the conferees, or where the conferees had arrived at an agreement and have changed their minds. In other words, this just is not the way we operate.

On the next point, do you want to show this, that as far as you are concerned you do not believe that discharges in Massachusetts affecting water pollution endanger health or welfare of persons in Connecticut?

MR. TAYLOR: I do.

MR. STEIN: The summary will so show.

Are there any other comments?

MR. WISE: Mr. Stein, I concur with Mr. Taylor's observation.

I certainly feel that the report or the results of this conference do not show that the health and welfare of the people of Connecticut are affected by the present conditions of the Connecticut River.

I also feel that it has been amply demonstrated that very active and progressive programs that are now underway in pollution control of all wastes discharged into the Connecticut River are being advanced so rapidly that there should be no reason to assume that the condition is not going to be tremendously improved in the immediate future, and that the State and interstate agencies should be given an opportunity to demonstrate that their programs will accomplish this purpose of cleaning up the Connecticut River.

You stated that the Connecticut River is not used or is not suitable for game fish.

Now, I don't know if there is a representative of the State Board of Fisheries and Game here, but I would like to state here that I have discussed this with the State Board of Fisheries and Game on a number of occasions, as to whether in their opinion the Connecticut River is suitable from the standpoint of many factors, not only pollution, for game fish in growth, and they claim that they can make no judgment as to whether, if the Connecticut River was cleaned up completely as far as pollution is concerned, game fish would thrive in Connecticut, because there are many factors.

They don't say they won't, but they had no indication of what the conditions would be like even under a clean stream condition, so I don't think we can stress that point.

They do say that there are many fish outside of shad that are dying in the Connecticut River from old age because they aren't fished out, so that the Connecticut River is suitable for many fish and the shad runs are increasing each year.

MR. STEIN: Again, just for the record, Mr. Frank of Connecticut in his statement spoke for himself on the potentiality of the game fish.

You have made the same point as Mr. Taylor, that you disagree with the conclusion. I don't think that we have any problem here. We have no reason to assume either that the Connecticut program for abatement in 1965 for the major part will result in a clean-up of the Connecticut River, and we don't doubt, as was pointed out to you, that this will take considerable time and effort even though this clean-up is being done, because there is no endangerment to the health and welfare of the people of Connecticut.

Do you have anything you want to say?

MR. KNOX: I suppose I should comment on this.

MR. STEIN: Yes.

MR. KNOX: I will have to go back to the primary rights and responsibilities of the State and interstate agencies in carrying out these programs.

Now, I think the Connecticut River is an excellent example of the States exercising their primary rights and responsibilities.

I made a few notes here, as this has progressed. I go along with the Connecticut River as an interstate stream. There is some interstate pollution, but not to the extent where it affects the health and welfare of persons in Connecticut.

I also conclude that a classification and abatement program is under way in both States, that exceptional abatement progress is being made; but the pace has lagged to a certain extent because of the nonavailability of Federal grants, and the coordinated time schedule of the States for future work on water pollution abatement, 1965 for Connecticut and 1966 for Massachusetts, is very realistic.

MR. STEIN: Now, I think again we all have one difference.

Obviously, Mr. Rogers disagrees, and Mr. Kittrell's report abundantly and overwhelmingly indicated pollution of the Connecticut River from sources in Massachusetts, endangering the health and welfare of persons in Connecticut, not that Connecticut wasn't contributing to this in any small measure itself, and we understand the point of view of you people.

I also think if you are thinking that the pace is set by Federal financing, and this is going to be accomplished in 1965 and 1966, I don't know that the pace is so bad, or what happens to the argument that Federal financing is holding up construction.

I think we are in major agreement on the summary, except for that single point. I don't think also that the single point need deter us, since all of us are agreed that certain remedial works are needed and are to be in operation in 1965 and 1966.

Is that agreeable?

MR. WISE: Yes.

MR. TAYLOR: Yes.

MR. KNOX: Yes.

MR. STEIN: I would like to say personally that this has been a very pleasant experience, as it always is, with you gentlemen in New England.

I might say, though you may not have guessed it, we are really old friends. We have known each other for many years.

As far as we are concerned from the Federal point of view, we have made a considerable amount of progress. I think the time schedule, as Mr. Knox pointed out, is a realistic one under the circumstances, and if it is accomplished, as I have every reason to believe it will be, by Massachusetts, Connecticut and the interstate agencies --and it is a State function and an interstate agency function to accomplish this, not a Federal agency function -- this is something for which you can be proud.

Again, I don't think this will go into any summary, but I think any casual look at the map will give you the notion and the idea, which is indisputable, that the major river valley in the whole New England area is the Connecticut River valley, and if these remedial works can be put in, indeed we will have preserved a resource.

MR. TAYLOR: I only have one question, and I rather dislike to do this.

Three of us, Mr. Knox, Mr. Wise and myself, and apparently you have agreed upon this, but I would like to ask Mr. Rogers if he has any objection to this.

MR. ROGERS: No. I think the schedule is very reasonable.

MR. TAYLOR: All right.

MR. STEIN: Are there any other comments? Mr. Wise?

MR. WISE: I would like to make this comment: We looked at the prospect of this conference with some fear and trepidation, but I would like to comment here, as a participant in it with Mr. Stein, that I am quite gratified at the attitude that Mr. Stein has taken towards this, and his feelings towards the results of this conference and what may come out of it, and that I hope that his superiors will concur with his judgment of the results of this conference.

MR. STEIN: Thank you very much.

I will say this: That at no time, wherever conferees have agreed, as we have here, has the Secretary not concurred.

MR. KNOX: I just want to add that I concur with Mr. Wise.

MR. TAYLOR: It was very well conducted, and I think a very fruitful conference.

MR. STEIN: I want to thank you all for coming, and I hope we can get these people out in ample time.

This has been very productive. Thank you again.

(Whereupon, at 3:20 p.m., the conference was concluded.)